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OPHTHALMOLOGY

ESSAYS, ABSTRACTS and REVIEWS

Vol. IX JULY, 1913 No. 4

Original Articles.

THE PHYSIOLOGY OF THE HYPOPHYSIS CEREBRI.

SUTHERLAND SIMPSON, D. Sc., M. D. (EDIN.),

CORNELL UNIVERSITY MEDICAL COLLEGE, ITHACA, N. Y.

In 1886 Marie[1] described a hitherto unrecognized disease which he named acromegaly, and which he found to be associated with pathological changes in the hypophysis cerebri. Since that time this organ has attracted the attention of many workers in all countries, and much light has been thrown both on its structure and functions, but in many respects the latter, particularly, are still obscure. In the short time at my disposal it will not be possible to give more than a very brief outline of some of the more important steps by which we have advanced to our present knowledge of the subject.

Comparative Anatomy.

In an important contribution to the comparative anatomy and histology of the pituitary, Herring[2] recognizes in the mammalian gland three types. In the first type, e. g. cat, the posterior lobe is hollow and its cavity communicates with the third ventricle of the brain. It is almost completely surrounded by the pars intermedia of the epithelial portion, the cells of which invade the tissue of the nervous portion to a considerable extent, rendering a separation of the two practically impossible. In the second type, e. g. the dog, the body of the posterior lobe is solid, but the neck is hollow and communicates with the third ventricle; the pars nervosa is here again almost completely surrounded with epithelium. In the third type, e. g. man, monkey, ox, pig and rabbit, the body and neck of the posterior lobe are solid, although traces of a cavity are occasionally found in the neck; in this type the epithelium does not invest the nervous portion so completely, but is aggregated around the neck and spreads over and into the adjacent surface of the brain.

The epithelial or glandular portion of the pituitary body is made up of two distinct parts: the anterior lobe proper, and the pars in-

termedia which invests the pars nervosa, the two together forming the posterior lobe. The cells of the anterior lobe are arranged in solid columns, between which run wide and thin-walled sinusoidal blood channels; they are of two varieties—chromophile and chromophobe, the former containing deeply staining granules in their protoplasm. The pars intermedia is composed of finely granular cells arranged in layers closely applied to the nervous portion of the posterior lobe, which consists of neuroglia and ependyma cells.

Herring believes that the posterior lobe forms a true brain gland, the colloid material produced by the cells of the pars intermedia passing through the nervous portion and escaping into the third ventricle, where it mingles with the cerebro-spinal fluid. The pituitary body may therefore be regarded as a gland that furnishes an external secretion produced by the pars intermedia, and also an internal secretion, formed by the cells of the pars anterior, passing directly into the blood vessels.

Functions of Posterior Lobe.

Oliver and Schäfer[3], in 1895, found that watery or saline extracts of the whole gland, when injected intravenously, produced a rise in the general blood pressure comparable to that obtained from suprarenal extracts, although not so great. They proved that the effect is brought about by an action on the peripheral vessels, as in the case of the suprarenal.

In 1898 Howell[4] separated the gland into its two lobes—anterior and posterior—and made extracts of each. He found that the pressor effect was obtained only from the posterior lobe, the anterior lobe extract being physiologically inactive. There was also a slowing of the heart rate, and both this and the rise in blood pressure lasted for a considerable time. In addition to this he found that if a second dose is injected, within half an hour or more of the first, there is no rise in blood pressure; some sort of immunity appears to be established to the pressor substances which passes off slowly.

In 1899 Schäfer and Vincent[5] repeated the experiments of Howell and confirmed his results. They found, however, that the slowing of the heart did not always follow, and that when it did occur it was not abolished by cutting the vagi or giving atropine, thus proving that its cause was not central but peripheral. On injecting a second dose after the first they not only obtained no rise in blood pressure, but invariably a fall, and they were successful in separating from the posterior lobe extract the depressor substance which produced this effect.

Pituitary extract has a stimulating action on other forms of plain muscle besides that of the blood vessels. Cramer[6] found that extracts of the posterior lobe of the pituitary of the ox produced a distinct dilatation of the pupil of the enucleated frog's eye. The action of a solution of adrenalin, 1 in 10,000, was more rapid, but it did not last so long. Dale[7] observed that infundibular extract caused powerful contractions of the uterine muscle, and this property has led to its use in obstetrical practice, notably in cases of post-partum haemorrhage. Bell and Hick[8] have recorded a similar action on the muscle of the intestine; the normal peristaltic movements are markedly accentuated after its application. Dale[9] believes that it acts directly on the muscle itself and not through the sympathetic nerve endings, in this respect differing from adrenal extract.

In 1901 Magnus and Schäfer[10] observed that the extract, injected intravenously in dogs, led to increased secretion of urine, and Schäfer and Herring[11], pursuing the subject further, found that the watery extract of the posterior lobe has a specific action on the renal blood vessels and kidney cells, for while it increases the arterial tonus in the other organs of the body, it leads to dilatation of the kidney vessels. They concluded that the diuresis is not due entirely to the increased blood supply of the kidney, since, under certain conditions, where there was no dilatation of the renal vessels the increased flow of urine took place all the same.

In 1910 Ott and Scott[12], using goats, and later Schäfer and Mackenzie[13], experimenting with cats and dogs, determined that the posterior lobe of the pituitary contains a substance which acts as a powerful galactogogue when the extract is injected intravenously. It would appear, however, from more recent investigations by Gavin[14] on the cow, and by Schäfer[15] on the human subject, that the administration of pituitary substance by the mouth, or by subcutaneous injection, or intravenously, during the period of lactation, does not increase the total quantity of milk produced in the twenty-four hours, nor does it affect its quality.

Intravenous injections of extracts of the posterior lobe would seem then to produce at least four distinct physiological effects—vaso-constriction in the systemic circulation generally with the exception of the kidney, where the usual result is vaso-dilatation; under certain conditions, general vaso-dilatation; increased secretion of urine; increased secretion of milk. Whether each of these actions is the result of a distinct and separate hormone is not cer-

tainly known, but there is a good deal of evidence in favor of this view.

A depressor substance was separated from the extract by Schäfer, and he also believes that the diuresis is produced by one substance and the dilatation of the renal vessels by another. Cramer's observations tend to show that the substance which acts on the pupil is not identical with that which stimulates renal activity. Recent work by Herring[16] would seem to show that the mammary hormone also is a distinct substance, not identical with any of the other active principles of the posterior lobe, since he finds that the pituitary extract of the skate, while it has no effect on blood pressure, kidney volume or urinary secretion, does excite the mammary gland.

With regard to the question as to where in the organ these active substances are formed there is much difference of opinion, but the views held by Herring are probably the most acceptable. He believes that the epithelial cells of the pars intermedia furnish a secretion (or secretions) which passes into the pars nervosa, and after modification or elaboration possibly, is stored there. "The subsequent disposal of this material may be accounted for in two ways—it may be absorbed by the blood vessels, and it may pass directly into the third ventricle and mingle with the cerebro-spinal fluid. The nervous lobe is comparatively poorly supplied by blood vessels, in its interior at least, but large and numerous vessels closely invest it. The granular material is often more pronounced around the capillaries in the lobe, and it is quite probable that the blood vessels receive some of it. As regards the likelihood of any secretion passing into the cerebro-spinal fluid, it will be seen from the figures how closely related the nervous lobe is in all cases to the third ventricle of the brain. The tubular character of the lobe in the avine pituitary, and the compound tubular structure of the reptilian pars nervosa are especially suggestive of such a view. In these pituitaries, too, it is usual to find much granular debris, and even actual cells lying free in the lumen. That epithelial cells do, under certain conditions, pass through the pars nervosa into the cerebro-spinal fluid, is undoubtedly the case in the mammalian pituitary."

Great caution, however, must be exercised in interpreting the results obtained by the intravenous injection of any glandular extract. Although several active substances may be present in the pituitary extract, it does not necessarily follow that these same substances are being continuously or intermittently produced by the gland in the living body and passed into the circulation. Before

we can be certain that these substances are formed in the living organ we must find indications of their presence in the blood or lymph, as it leaves the gland, or in the cerebro-spinal fluid. Cushing and Goetsch[17] claim that the active principles are to be found in the cerebro-spinal fluid, both in man and the lower animals, for when this is slightly concentrated and injected intravenously, effects similar to those which follow injections of the extract are obtained. This, however, has been questioned by Carlson and Martin[18].

Functions of Anterior Lobe.

It is generally agreed that extracts of the anterior lobe are physiologically inactive, so that no evidence bearing on the functions of this part of the pituitary can be obtained by the method of intravenous injection.

In an extensive series of extirpation experiments Paulesco[19], and later Cushing and his co-workers[20], found that complete removal of the gland resulted invariably in death, usually within from three to five days after the operation. They were also able to show that it is the anterior rather than the posterior lobe which is essential to life, since removal of the latter alone, including the pars intermedia, led to no definite symptoms and was not fatal. Dogs were employed in these experimental extirpations.

In partial hypophysectomies (a fragment of anterior lobe was left behind) a train of symptoms followed which simulate closely some of the clinical syndromes observed in man. There was general adiposity, "nutritional changes in the skin and its appendages, disturbance of carbohydrate metabolism, of body temperature, of growth and of renal secretion. Sexual inactivity or actual atrophy of the reproductive glands was observed; and indeed modifications in most of the other ductless glands proved to be histologically demonstrable." Mental dullness, often accompanied by irritability, was observed in a number of the animals.

According to Schäfer[21] the addition of small quantities of pituitary substance to the food of young rats appeared to favor their growth, as compared with control animals of the same litter. Sandri[22] fed young rats on anterior lobe alone (small amounts mixed with their ordinary food), with entirely negative results, whereas feeding with posterior lobe arrested their development. The results of Goetsch and Cushing[23] with young dogs were also largely negative. Schäfer found that feeding with posterior lobe led to an increase in the amount of urine secreted.

Changes in metabolism as the result of pituitary feeding have been recorded by several observers. Malcolm[24], using the dried and

fresh gland of the ox on the dog, found that the glandular portion in the dried form caused a slight retention of nitrogen, and the dried nervous portion had a similar effect. The fresh entire gland, in large doses, had an opposite effect and increased the output of nitrogen.

The glandular portion caused a retention of phosphorus, while the nervous portion caused a loss followed by a retention.

Using the dried organ, both the anterior and posterior lobes gave an increased output of calcium (on a calcium-rich diet), but while the excretion of calcium in the former case was accompanied by increased output of magnesium, the latter was not so accompanied; this points to the nervous portion as having a katabolising influence on bony tissue. Fresh gland substance gave no increased calcium output but rather a tendency in the opposite direction.

In the case of nitrogen and calcium the fresh gland has an opposite effect to that of the dried, pointing to the probable existence of more than one active substance.

According to Exner the transplantation of additional pituitaries into an animal leads to an increase in weight which is partly due to increased growth of bone and partly to the accumulation of fat.

The pathological changes in the pituitary associated with the condition of acromegaly, has thrown some light on the functions of the organ. These changes are believed to be the primary cause of the disease. Marie, who first described the condition, held the view that the symptoms were due to a destruction of the organ, that is, to a total suppression of its functional activity. In the light of present knowledge, this might be interpreted to mean that in the normal condition a hormone is secreted which inhibits or controls the growth of the skeleton and soft tissues, and that when this is absent (apituitarism) or produced in diminished amount (hypopituitarism) growth proceeds abnormally.

On the other hand, many believe that acromegaly and gigantism are associated with a hypersecretion of the epithelial elements of the organ rather than with a hyposecretion. In a great many cases, the post-mortem findings have shown merely glandular hyperplasia, or tumors of adenomatous type, involving the anterior lobe. Those anomalous cases, where the gland is found to be completely destroyed at death, may be satisfactorily explained, according to Schäfer[25], by assuming that in the early stages of the disease, and throughout most of its course, the changes are of the nature of a simple glandular overgrowth; that subsequently this non-malignant hyperplasia becomes malignant in character which rapidly leads

to destruction of the whole organ and so to a fatal termination. If this is a correct explanation of the cause which lies behind the symptoms and signs of acromegaly then it may be inferred that normally a substance is produced which stimulates rather than retards growth.

The opposite condition—the *degeneratio-adiposo-genitalis of* Frölich—in which there is a tumor of the hypophysis without the symptoms of acromegaly, would also fall into line with this theory, since Cushing, by removing most of the anterior lobe has produced experimentally a similar condition in dogs.

Functional Relationships Between Pituitary and Other Glands of Internal Secretion.

With regard to the relationships existing between the pituitary and the other glands producing internal secretions, our knowledge at the present time is so incomplete that perhaps the less said now, the less there will be to withdraw subsequently. It seems certain, however, that functional and anatomical changes in the hypophysis lead to changes in the glands of the reproductive system, and possibly also in the thyroid and suprarenals. It is also certain that in some animals removal of the thyroid leads to hypertrophy of the pituitary, but less certain that the same result follows castration [Degener and Livingston[26]]. According to Biedl[27] it is probable that hyperfunction of the hypophysis is associated with hypertrophy of the cortical portions of the suprarenals, together with a diminution both of function and of volume in the thyroid. The significance of these relationship and the mechanisms by which they are manifested are not understood.

BIBLIOGRAPHY

1. Marie, P., Rev. de Med. 1886, VI, p. 297.
2. Herring, Quart. Jour. Exper. Physiol., 1908, Vol. I, p. 121.
3. Oliver and Schäfer, Jour. Physiol., 1895, XVIII, p. 277.
4. Howell, Jour. Exper. Med., 1898, III, p. 245.
5. Schäfer and Vincent, Jour. Physiol., 1899-1900, XXV, p. 87.
6. Cramer, Quart. Jour. Exper. Physiol., 1908, I, p. 189.
7. Dale, Jour. of Physiol., 1906, XXXIV, p. 163.
8. Bell and Hick, Brit. Med. Jour., Feb. and March, 1909.
9. Dale, Bio-Chem. Jour., 1906, IV, p. 427.
10. Magnus and Schäfer, Jour. of Physiol., 1901-2, XXVII, Proceedings p. 9.
11. Schäfer and Herring, Phil. Trans. Roy. Soc., 1906, Vol. 199, p. 1.
12. Ott and Scott, Proc. Soc. Exper. Biol. and Med., 1911, VIII, p. 48.
13. Schafer and Mackenzie, Proc. Roy. Soc. London, 1911, B 84, p. 19.
14. Gavin, Quart. Jour. Exper. Physiol., 1913, VI, p. 13.
15. Schäfer, Quart. Jour. Exper. Physiol., 1912, VI, p. 1.
16. Herring, Quart. Jour. Exper. Physiol., 1912, VI, p. 71.
17. Cushing and Goetsch, Amer. Jour. Physiol., 1910, XXVII, p. 60.
18. Carlson and Martin, Amer. Jour. Physiol., 1911, XXIX, p. 84.
19. Paulesco, L'hypophyse, its carveau, Paris, 1908, Vigot Freres.
20. Cushing, The Pituitary Body and Its Disorders, 1912, Philadelphia and London, Lippincott Company, p. 17.
21. Schäfer, Proc. Roy. Soc. Lond., 1905, B 81, p. 433.
22. Sandri, Arch. ital. de Biol., 1909, LI, p. 337.
23. Cushing, loc. cit., p. 11.
24. Malcolm, Jour. of Physiol., 1904, XXX, p. 274.
25. Schäfer, loc. cit., p. 486.
26. Degener and Livingston, Proc. Amer. Physiol. Soc., 1913-14, p. 14.
27. Biedl, Innere Sekretion, 1910, Wien., p. 320.

THE VALUE OF THE GALLEMAERTS' MAGNETOMETER IN THE DIAGNOSIS OF INTRAOCULAR FOREIGN BODIES.

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Since the introduction of the electro-magnet into ophtalmic surgery, the prognosis of a piece of iron in the eye is not so bad as formerly; therefore the extraction as soon as possible after the accident is necessary to obtain a favorable influence on this prognosis. To perform this operation an accurate diagnosis is necessary and when looking over the American and English ophthalmological journals, one is astonished to see how little the sideroscope and the magnetometer are mentioned.

I recognize before all that the Xrays are of remarkable accuracy for the diagnosis of large foreign bodies, but I must add that the use of this means of diagnosis is much less practical than the use of the magnetic needle, even uncertain sometimes for foreign bodies of less than a milligramm.

It is not my intention to deal with the giant magnet as a means of diagnosis, it having proved unsuccessful in many cases.

In Professor Gallemaerts' eye clinic in Brussels, a constant use

*Bulletin et Mémoires de la Société Francaise d'Ophtalmologie, Vol. XXVIII. Bulletin de la Société Belge d'Ophtalmologie, Vol. XXX.

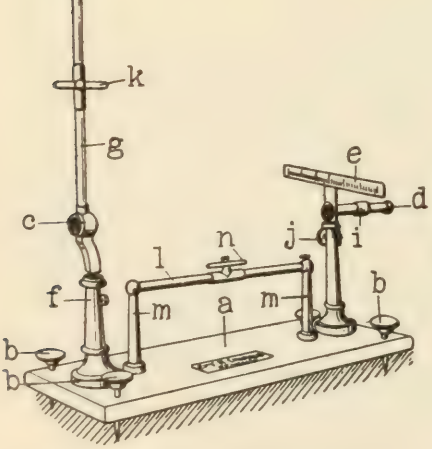


Fig. 1. Gallemaerts' Magnetometer.

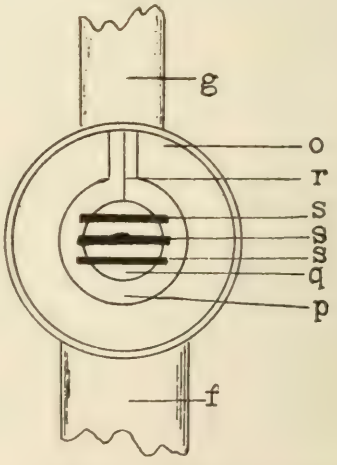


Fig. 2. Magnetic system.

is made of the magnetometer devised by Gézard. The one actually used is the new model perfected by Professor Gallemaerts, shown before the French and before the Belgian ophthalmological societies in May, 1911. The inventor describes his instrument as follows:

"The apparatus consists of a marble plate (fig. 1, a), 20 cm in breadth, 48 cm in length, supported by 4 lowering screws (fig. 1, b). At one end is the magnetic system (fig. 1, c and fig. 2), at the other the optical (fig. 1, d) with graduated rule (fig. 1, e); the distance between the two systems is 40 cm.

"The magnetic system is placed in a small case (fig. 1, c) 28 mm in diameter, 12 mm thick; this case is supported by a column (fig. 1, f) 17 cm in length and is closed before and behind by a glass plate; the posterior glass plate is concave in order to diminish the distance between the patient's eye and the magnet.

"This case is covered by a ring of copper (fig. 2, o), 8 mm thick and pierced by an hole (fig. 2, p), 13 mm wide, in order to receive the mirror (fig. 2, q); in a hole above is the suspension cocoon thread (fig. 2, r). This case is surmounted by a copper column (fig. 1, g) 34 cm in length, terminated by the suspension system of the magnetic apparatus, which is composed of a screw (fig. 1, h), allowing the suspension axis to be turned and supporting a small nut (fig. 1, h) which manipulates the cocoon thread. On turning this nut, one can raise or lower the magnetic system.

"This magnetic system is made up of three small magnets (fig. 2, s) 10 mm in length and 1 mm in width, the poles of same name directed in the same direction; these magnets are stuck on the back of a plane mirror, 8 mm in diameter (fig. 2, q).

"The optical system consists of a small telescope (fig. 1, d), with a rack pinion (fig. 1, i). Above is a rule (fig. 1, e), graduated in millimeters, of which the graduations are reflected by the plane mirror of the magnetic system and read through the telescope. The optical system is raised and lowered by another rack pinion (fig. 1, j).

"On the copper column (g) will be seen a little magnet (fig. 1, k) 5 mm wide and 5 cm long, which can be moved in any direction; this is to be set according to the magnetic meridian viz with the north pole pointing towards the north.

"Between the optical and the magnetic system is an horizontal bar (fig. 1, l) on two vertical supports (fig. 1, m). On this bar will be seen another magnet (fig. 1, n) of the some size and directed perpendicularly to the mirror. One can move it either vertically or horizontally in order to bring the scale to zero. It can equally

be brought nearer or further from the mirror, the varying of its position increasing or decreasing its action.

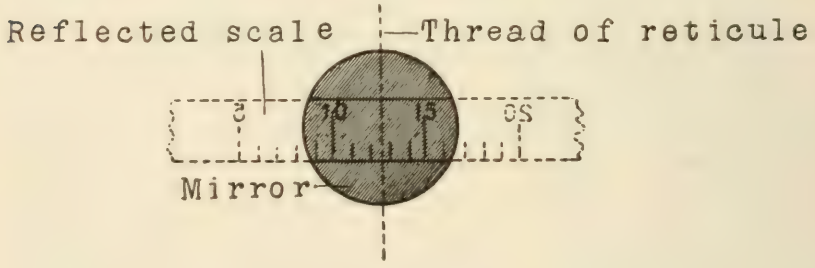
"The magnet k serves to counteract the terrestrial magnetism; the presence of the cooper ring is to regulate the oscillations by producing induced currents in the metallic mass."

Use of The Instrument.

The instrument is placed, perpendicularly to the magnetic meridian, on a solid table or even better on a slab built into a wall. Blows and shaking must be avoided as much as possible as they tend to put the apparatus out of order.

By the aid of the 4 lowering screws the perfect vertical position of the thread which supports the mirror is assured. The mirror must move freely in its case without touching the sides and be placed in the optical axis of the telescope by moving the suspension thread. If the plane of the mirror is not perpendicular to the optical axis of the telescope, the upper part of the column, to which the thread is fixed, must be carefully turned.

The telescope contains a reticule which must be focussed. When the mirror is regarded through the telescope the following image will be seen:



The reticular thread is projected on the reflected and enlarged image of the graduated rule.

By moving the two magnets k and n the apparatus can be regulated in a few mometns.

The examination is made in the same way as with any other sideroscope.

The patient must first of all remove all iron or steel objects likely to affect the apparatus (studs, links, buckles, keys, watch, etc.) and sit down.

The eye to be examined is brought as near as possible to the concave glass plate forming the back of the cage in which the mirror is situated. The examiner can easily bring the head into required

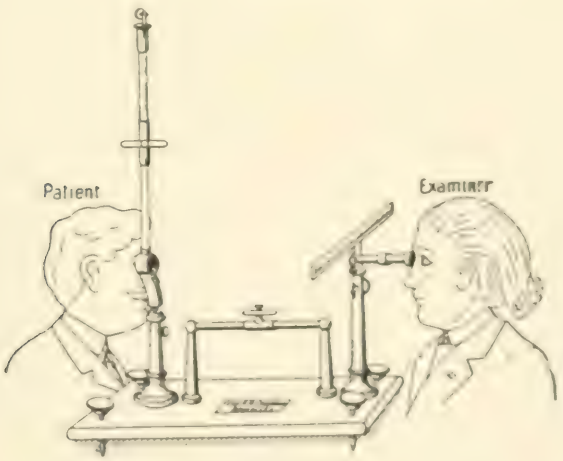
position by holding the patient by ear or nose. Without moving the head, the eye must be moved in all directions.

If there is no magnetic body, no movement will be seen; whilst in the event of a foreign body being present, the reflected image of the scale will go from right to left and vice versa. The amplitude of these oscillations is in direct connection with the size of the foreign body and the distance of same from the magnetic system.

If the examination is negative, the patient is made to undergo the action of an electro-magnet for a few instants, in such a manner to magnetize an eventual foreign body. If the magnetic needle does not budge, we can be certain that nothing in the nature of an iron or steel body is present. However if it moves, ever so little, we can be convinced that there is, in the eye or neighborhood, a magnetic fragment.

The differential diagnosis between intra-ocular and intra-orbital foreign bodies is easy. In the first case the oscillations will be increased by some certain movements of the eye; in the second case they will be increased by the movements of the head.

The diagnosis rests therefore on an elementary physical phenomena which cannot be confounded; a simple proof quite objective



thus allows an exact diagnosis: even foreign bodies of less than a milligram have been found by this method.

To show the value of the magnetometer, I have recorded different cases which came under observation during the few past years in Professor Gallemaerts' eye clinic.

	Interval between accident and examination	Result of examination with the magnetometer	Pain with electro-magnet	Weight of foreign bodies in milligramms	Remarks
1	7 weeks	+	—	6 mgr	f. b. visible.
2	½ day	+	—	10 mgr	
3	1 day	+	—	4 mgr	
4	4 days	+	+	100 mgr	
5	8 days	+	+	50 mgr	
6	3 weeks	+	+	5 mgr	
7	3 days	+	+	400 mgr	
8	12 days	+	+	20 mgr	
9	10 days	+	+	5 mgr	
10	25 years	+	+	25 mgr	f. b., encapsulated.
11	3 years	+	+	10 mgr	f. b., encapsulated.
12	17 days	+	+	5 mgr	Xrays negativ.
13	2 days	+	+	23 mgr	
14	4 days	+	0	Needle	Xrays negativ.
15		0	0	No. f. b.	Xrays positiv.
16	7 days	+	+	1 mgr	
17	2 days	+	+	1 mgr	
18	2 days	+	+	8 mgr	
19	5 days	+	0	2 mgr	
20					
21	3 hours	+	+	19 mgr 14 mgr	Two f. c.
22	1 day	+	+	3 mgr	
23	1 day	+		4 mgr	f. b. in the iris.
24	14 months	+	+	5 mgr	
25	5 days	+	+	40 mgr	
26	4 days	+	—	18 mgr	
27	14 days	+	+	60 mgr	
28	11 days	+	+	350 mgr	
29		0	0	Copper	Xrays positiv.
30	1 day	+	+	Not weight	
31	5 days	+	+	5 mgr	
32	3 days	+	+	217 mgr	In the orbita.
33	1 day	+	+	12 mgr	
34	4 weeks	+	+	20 mgr	
35	2 hours	+	+	8 mgr	
36	5 days	+	+	4 mgr	
37	12 months	+	0	Less as 1 mgr	
38	1 day	+	+	5 mgr	
39	7 months	+	0	Not weight	
40	15 days	+	+	4 mgr	
41	12 days	+	+	8 mgr	
42	1 month	0	0	6300 mgr	Bullet of revolver.
43	1 day	+	+	5 mgr	
44	3 hours	+	+	7 mgr	
45	1 day	+	+	23 mgr	
46	5 days	+	+	40 mgr	
47	9 days	+	+	240 mgr	
48	12 days	+	+	Less as 1 mgr	
49	3 days	+	+	28 mgr	
50	1 day	+	+	9 mgr	
51	3 hours	+	0	2 mgr	
52	23 days	+	+	17 mgr	
53	1 day	+	+	130 mgr	
54	2 days	+	+	130 mgr	
55	1 day	+	+	29 mgr	
56	2 days	+	0	16 mgr	
57	1 day	+	+	1410 mgr	In the optic nerve.
58	2 days	+	0	30 mgr	
59	2 days	+	+	11 mgr	
60	8 days	+	+	25 mgr	
61	6 weeks	+	0	14 mgr	
62	15 days	+	0	Less as 1 mgr	
63	4 days	+	0	Not weight	Encapsulated.
64	12 days	+	+	Less as 1 mgr	
65	11 months	+	+	7 mgr	
66				Less as 1 mgr	
67	9 days	+	+	Less as 1 mgr	
68	7 days	+	0	15 mgr	
69	3 days	+	+	Not weight	
70	2 days	+	0	Not weight	

According to this table, we see that out of 70 cases of intra-ocular foreign bodies, the magnetometer never failed.

On this table are not mentioned the cases in which there were no foreign bodies.

Every injured eye which came under observation in the clinic was examined by means of the magnetometer (just a few moments are necessary to do it); if there was no deviation of the magnetic needle, no surgical interference was done. And until now the subsequent evolution of the accident has corroborated to the negative answer of the instrument.

ABSORPTION OF THE LENS NUCLEUS IN A PATIENT, AGED SIXTY-SIX YEARS.

WILLIAM H. DUDLEY, M. D.,

LOS ANGELES, CAL.

The infrequency with which the absorption of the nucleus of the crystalline lens takes place in those over thirty years of age, leads me to report a case of this character which came under my care about four years ago.

Mr. J. B., a miner, aged sixty-six, presented himself March 5, 1909, with the following history:

While using a miners' pick for the purpose of cleaning out the floor of the tunnel of his mine five days previous along which water was running, his pick struck a piece of old "giant" which had lain in this location for many months, which condition the patient stated would change the character of the explosive, often making it more active in its work than when fresh. The result was that his clothing was more or less torn by the flying quartz, and his face and eyes were also damaged. His left eye suffered mostly, there being a large number of pieces of quartz of varying sizes imbedded in the cornea, some of which were quite deep, two of which had produced abscesses. Careful examination did not reveal any sign of complete penetration of the cornea by the quartz, though the cornea was much infiltrated, so that this question could not be satisfactorially determined. By this time a rather active iritis existed, and after dilating the pupil, the lens was found to be cataractous throughout, and swollen, with quite narrow anterior chamber. The tension was normal as taken by the fingers, the projection good, and but very little pain. The eye was quite red but not chemotic. As much as possible of the quartz was removed from the cornea, atropine instilled, and eye watched. About a month later the reaction was much less, tension increased at no time; but now a small flake of lens matter appears in the anterior chamber. About three weeks later, or on April 24, the lids became edematous without any known cause, which however subsided in a few days. Lens matter was observed in the anterior chamber much of the time till October 26, when the patient notices a little vision in this eye—can see windows in the building across the street, and the ophthalmoscope shows a red reflex through a small opening in the middle of the lens.

Two weeks later the tunnel through the lens was 4-5 mm. in diameter, and four months later, or February 1, 1910, through a wide pupil no sign of lens matter could be seen, the fundus was normal, and with proper lens he could see 20/40, and could read Jaeger No. 1 without much hesitation. This was somewhat better than I would have expected with the amount of corneal opacity present. In reference to the cause of the rupture of the lens capsule, I could not be sure; whether a small piece of quartz penetrated the cornea and the capsule of the lens, or whether the force of the concussion was sufficient to rupture the capsule, I do not know. If a piece of quartz, however small had entered the lens, I would expect, when it became free to set up some reaction of importance, which however did not occur, and I am therefore of the opinion that the concussion was the cause of rupture of the lens capsule.

FIVE CASES OF SENILE CATARACT TREATED BY SUB-CONJUNCTIVAL INJECTIONS OF POTASSIUM IODIDE.

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VICTORIA, BRITISH COLUMBIA.

F. R. C. S. Edin. Major Indian Medical Service.

The following notes are copied from my record of ophthalmic cases. The cases occurred when I was civil surgeon of the Kurram Agency. N. W. Frontier, India, from 1908 to 1911.

Case 1. H. B. Mahomedan, male, age about fifty.

17.3.09. R. E. V=6/15. L. E. V=6/24.

Dark room examination. Cataract equatorial both eyes.

29.3.09. K. I. solution 1% m 12 injected under conjunctiva of both eyes. Caused much pain. Had pain till next morning. Morphia gr. 1/3 at night.

30.3.09. R. E. pupil slightly dilated. Pain.

31.3.09. and 1.4.09. Pain continued.

6.4.09. R. E. V=6/12. Subconjunctival injection K. I. 1% m 3 with cocain. L. E. V=6/12.

9.4.09. No pain but feeling of foreign body. R. E. V=6/8 fully. Opacity as before internally but perhaps less. A few spots throughout especially one above coming down from equator. O. disc clearly seen. K. I. 1% m 3 acoin 1% m 2 injection. L. E. V=6/8 fully. Down and in dense opacity as before, no less and perhaps more. O. disc clearly seen. K. I. 1% m 5 instilled.

11.5.09. No pain followed last injection. R. E. V=6/6 nearly. Dark room; appearance much the same. On strong inversion opacity internally cuts the circle of red reflex. Certainly no increase. K. I. 1% m 4 acoin 1% m 3 injection. Some pain and lacrimation followed. L. E. V=6/12 nearly. Dark room, no change. O. disc clearly seen. K. I. 1% m 5 instilled.

18.5.09. R. E. V=6/8 fully and part of 6/6. Dark room, appears clearer, the spot above invisible. K. I. 1% m 3 acoin 1% m 2 injection. L. E. V=6/10. Dark room much the same. K. I. instilled.

26.5.09. Vision not tested. Dark room, no change. R. E. K. I. 1% m 2½.

10.6.09. R. E. V=6/6. Dark room, pupil fairly big. Equatorial opacity down and in and a few spokes centrally from it. L. E. V=6/6. Subconj. injection K. I. 1% m 2 acoin both eyes.

17.9.09. Says vision remains good. Not tested. Dark room.

R. E. opacity down and in much the same. Certainly not bigger. The linear opacity running down from upper equator not seen. There are dots of opacity throughout lens in pupillary area. Disc well seen in detail. L. E. the large opacity down and it is certainly no bigger. Compared with former picture is less. Disc well seen in detail.

In September, 1909, I showed this case to the late Dr. Pennell of the Bannu Mission Hospital and in October, 1910, to Captain C. H. Reinhold, F. R. C. S. Edin. of the Indian Medical Service. They both agreed with my objective findings as to the extent of the cataract. The patient, one of my servants, remained with me till I went on furlough in November, 1911. I tested his vision shortly before I left but have mislaid the note I made at the time. The objective signs and vision were practically the same as in September, 1909.

Case II. M. A. Mahomedan, male, aged about fifty-five years.

16.8.09. Seen in his village. Double cataract.

17.8.09. R. E. V=large movements. Lens a dirty greyish green color. T. N. Slight discharge. Light projection good. K. I. 1% m 5 acoin. Subconj. injection. L. E. V=P. L. Light projection good. T. N. cataract very nearly ripe. Greyish brown color. Preliminary iridectonomy up. General health indifferent. Frequent micturition. Anaemia.

18.8.09. L. E. dressed, eye quiet.

19.8.09. Urine examined. Strongly alkaline. sp. gr. 1030. Solid white deposit. No albumin. No sugar. L. E. slight pain. Atropin.

20.8.09. R. E. V=fingers counted with difficulty but there is no doubt of the improvement. Patient voluntarily stated that he has more vision than before in the right eye. L. E. no pain. Pupil dilated. Eye quiet.

21.8.09. R. E. K. I. 1% m 5 acoin. Subconj. injection. L. E. slight discharge. Weak caustic.

23.8.09. R. E. vision certainly improved. Counts fingers easily.

1.9.09. L. E. Extraction of lens, limbal incision, conjectival flap, capsulotomy, fluid cortex, easy extraction, irrigation of anterior chamber nozzle being introduced.

4.9.09. R. E. K. I. injection. L. E. has been dressed daily, doing very well.

8.9.09. R. E. K. I. injection. L. E. doing well.

9.9.09. R. E. V=largest dots at ½ m.

15.9.09. R. E. K. I. injection. L. E. quiet V=2/60+11 D. Sph. =6/12. Patient discharged. To attend as out patient.

17.9.09. R. E. V=largest dots at ½ m easily and fingers very easily. He certainly could not count fingers when the injections were begun. Dark room examination in the R. E. the cataract seems to have cleared slightly in the lower outer quandrant but still no fundus reflex present.

23.9.09. R. E. K. I. injection. L. E. V=2/60 nearly + 11 D. Sph.=6, 12.

28.9.09. R. E. injection.

Injections were given on the 12th and 18th of November and then as no further improvement followed I extracted the lens on the 25th of November. In the record it is noted that the conjunctiva was adherent as the result of the injections and the cortical matter was semi-solid. The remainder of the record is of no further interest.

Case III. M. H. Mahomedan, male, age about seventy-five years.

1.4.09. Epiphora. Canaliculi slit, syringing, fluid passed into nose.

7.4.09. Homatropin. Ophthalmoscope. Unmistakable equatorial cataract both eyes.

8.4.09. K. I. solution instilled in both eyes.

21.5.09. Attended. Cocain. K. I. 1% m 3 Subconj. injection both eyes.

25.5.09. Attended. K. I. 1% m 2½ acoin m 2½ both eyes, followed by much pain and some chemosis.

28.5.09. K. I. 1% instilled, both eyes.

10.6.09. Says he is no better. Dark room, after homatropin, equatorial cataract both eyes, in and down chiefly. K. I. instilled both.

22.6.09. Dark room, pupils fairly dilated. R. E. O disc well seen. K. I. 1% m 1½ acoin m 2½.

12.7.09. Says vision is getting less. Dark room, no difference. R. E. V=1/60. L. E. V=1/60. K. I. 1% m 3 acoin 1% m 2 both eyes.

19.7.09. Homatropin. Dark room, no change. Both eyes K. I. m 4 with acoin m 2.

28.7.09. Injection. 12.8.09. Injection.

15.9.09. Has not been attending. Says his vision is diminishing.

3.11.09. Says his vision is worse. Ophthalmoscope shows no change. K. I. injection in both eyes.

August, 1911. Attended for pains in his legs. He has aged a lot. Eyes examined. Vision not tested and pupil not dilated.

Through normal pupil the cortical opacities can only be seen on strong adduction or abduction.

Case IV. A. K. Mahomedan, male, age seventy-five years.

4.8.09. Double cataract. Conjunctiva unhealthy.

6.8.09. Dark room. Light projection good. Caustic daily.

19.8.09. Discharge less. From today boric eye bath.

23.8.09. L. E. subconj. injection. K. I. 1% m 5 acoin 1% m 3 today V=hand movements.

27.8.09. L. E. injection K. I. m 4. Still discharge.

1.9.09. L. E. injection. Today he says that formerly he could not see hand movements and now he can; he and his wife both think that vision has improved.

The subsequent record is of no further interest. On 4.9.09 I performed extraction in the R. E. and he left hospital on 10.9.09. On 10.10.09 his wife reported that he had good vision in his right eye and had ceased to think about his left eye.

Case V. F. H. Mahomedan, male, age about fifty.

10.9.09. R. Eye. Slight failure of vision since two years.

R. V=6/60. Dark room. No opacities seen with undilated pupil. K. I. injection m 3½. L. eye steady failure of vision since three years. There is an advanced cataract. L. V.=hand movements. Dark room, cataract nearly ripe. It is greyish white with bright white talc like patches anteriorly. K. I. injection m 3½.

15.9.09. R. E. Homatropin, cocain. Dark room, lens has a stippled cracked ice appearance but cocain had caused shedding of epithelium which spoilt examination. K. I. injection. L. E. same as before. K. I. injection.

20.9.09. Both eyes. No change. Injection K. I. 1% m 5.

23.9.09. R. E. V=6/60 fully. Injection. L. E. No change. Injection.

28.9.09. Both eyes injection.

2.10.09. Both eyes injection. Says R. vision is better=6/60, but he says he can now see and almost count 6/40. This man stopped attending.

In several other cases I tried the injection treatment but the patients failed to attend. The conditions were adverse, the country being sparsely populated and the communications very poor.

Comment on Above Cases.

Case I. Allowing for the fact that a rather stupid illiterate man would count test dots with greater facility after some practice and allowing for possible variations in illumination and in the size of the pupil at the different examinations made, still the increase in

vision was unquestionable. The improvement was freely admitted by the patient and it was evident in his work. He was a house servant and his eyesight came under suspicion in March, 1909, because he did his work imperfectly and broke much china. Soon after treatment was begun he ceased breaking crockery to anything like the same extent as before and his work was better done.

It is very difficult to record accurately minute changes in the objective appearances of a case such as this. I made drawings from time to time, and both from the drawings and the record it is evident that during the period I had this case under observation the cataract did not increase in either eye.

Case II. In this case I decided to extract from the left eye because I did not expect that the patient would attend sufficiently often for the injection treatment. He lived in a village 5 miles distant over rough country.

From the record we see that in one month after 5 injections the vision of the right eye improved from "large movements" to counting fingers very easily and counting the largest sized test dots at half a meter. This man was the most intelligent patient in the series, and apart from the definite subjective tests, I would be inclined to accept his very emphatic opinion that his vision improved as a result of the injections.

Case III. This patient was pretty deaf, rather stupid and extremely obstinate. He had many ailments which he described at length and he never would admit that he got any relief from the varied treatment that we gave him. I made many attempts to record his vision but usually gave it up in despair as a waste of time. There are no accurate details either subjective or objective. The best that can be said for the treatment in this case is that during $2\frac{1}{2}$ years the cataract remained practically stationary. When I last saw him in November, 1911, he was going about, as far as his eyesight was concerned, as freely as when I first saw him in 1908. I knew him from April, 1908, but he did not become my patient till the following spring.

Case IV. This case shows how unreliable are the opinions and statements of patients.

On September 1st both the patient and his wife had forgotten that a week previously he could distinguish hand movements. I did extraction from the right eye as soon as the conjunctiva became sufficiently healthy, for I knew that the patient, an Afghan, from across the border, would not remain long in hospital. He left on the 10th of September.

Case V. There appears to have been an improvement in the vision of the right eye from 6/60 to almost 6/40, but the case chiefly illustrates the difficulty of giving prolonged treatment to patients in India. This man came from the same village as case No. II. I saw him several times subsequently. He was apparently content to sit in the sun with such vision as he had.

General Conclusions.

From what I had read on the subject up to 1909 I was not at all sanguine as to results, but when I got a suitable case in my own household I thought the opportunity too good to be missed.

As regard dosage and technique there is little to be said. In case I my initial dose was too big. I had been giving subconjunctival injections of normal saline, sterile air, mercury cyanide, fibrolysin and other drugs for some time previous to 1909 and I did not anticipate so much irritation from K. I. Acoin is a useful addition to these injections. Its action is slower but more lasting than that of cocain. It has to be carefully prepared. The needle should be a fine one and it should be passed for some distance into the subconjunctival tissue, otherwise the fluid is apt to escape on withdrawal of the needle. Often I give morphia hypodermically 20 minutes before the subconjunctival injection.

In Case I the cataract certainly did not progress during more than 2½ years, and in Case III there was practically no increase during a similar period. It is of course possible but highly improbable for senile cataract to remain stationary or undergo spontaneous absorption.

Out of some 700 cases of extraction for senile cataract I have kept a detailed record of nearly 400 cases. The average duration from the time vision began to diminish to date of admission works out to approximately 3 years. Nearly mature and hypermature cataracts are included. Thus there is one hypermature case of 12 years and another of 8 years duration.

As a result of my personal experience of this treatment I think that the method deserves further trial.

TWO CASES OF LACHRYMAL CYSTS.

Dr. Juan Santos-Fernandez,

HAVANA, CUBA.

Camuset said once[1] that tumors originating in the lachrymal duct offered a real clinical interest, because they are accompanied by an inflammatory appearance which often makes the diagnosis harder. The two cases we are about to describe were one adherent to the wall of the upper left lachrymal duct of a man, and the other to lower left lachrymal duct of a woman. Both surprised us because in both we saw pus coming out of the duct and in both cases water could be injected and penetrated to the throat and nasal fossae, without however going into the cyst. It was also possible to pass a silver thread through the duct, thus confirming its integrity already made evident with Anel's syringe.

We suspected, however, that the cyst had perforated the wall of the duct, through which perforation the cyst had become infected, thus explaining the suppuration. On that supposition we dilated the lachrymal punctae, in such a way as when catheterism of the nasal duct is going to be done. After the cyst had been emptied, we try to wash its interior with a syringe with a thick bulb, for its contents had come out as soon as the lachrymal punctae was dilated, the contents consisted of pus, a small quantity of a yellowish liquid and a substance of hard appearance which we did not keep but was thought by us to be sebaceous and not calcareous.

The swelling of the cyst that in the first case was the size of a large pea and lasted for 40 years, disappeared immediately, causing great surprise to the patient. The lady of the second case had had her cyst for a short time only, but was free from it also as soon as the lachrymal punctae were dilated.

As can be seen, in this two cases there was not a primary affection of the ducts but a secondary one. The lachrymal duct, in spite its small size is as we know the site of various affections that provoke the distension of its walls, for example: *Lithiasis lagrymalis*, and what is described as Steptothrix of the lachrymal duct; in the first case the incision of the duct brings out small concretions of ammonium-magnesium phosphates. In the case of the leptothrix, the incision brings out a curdled oval mass, of yellowish color, which is formed by an interlacing of the Micelian filaments, surrounded by mucus. It is, of course, an Steptothrix

1. Camuset. Tumours a leptothrix des vois lagrimales. Revue Cliniquqe d'Oculistique de Sud-Ouest, 1882. Journal de Medecine et de Chirurgie, p. 366, Aout, 1883. Revue Generale de Ophtalmologie, p. 556, 1883.

(vegetal parasite), discovered by Kehn in 1873 and recently studied in detail by Morax, of Paris, and Frank, of Hamburg, but not Actinomycosis as suspected by Orloff in a case in which he consulted Morax, somewhat recently[2]. (Wiestnik Ophtalmologie, Vol. 27-1907).

Polypi and other neoplasic tumors of the lachrymal ducts have been described repeatedly but in the cases described by us, it seems that the duct did not become affected until communication was established, infecting the contents of the cyst and causing suppuration. Mitvalsky[3] published some years ago a case which, judging by the contents of the cyst has some resemblance with the two cases we are describing.

Observation I. A. R. C., man 72 years old, of good constitution, belonged to a family to which we were the regular specialist, but in spite of having seen this man several times with blue spectacles, we did not think anything was the matter with him. He consulted us for the first time on April 26, 1911, and he had been at my office the day before believing to have some foreign body in his left eye. He stated that he wanted our opinion about a long standing ocular affection, which lasted for the past ten years. At the beginning he consulted Dr. X., who had made a diagnosis of granular conjunctivitis and had treated him with silver nitrate on his left eye, without experimenting any improvement. Another doctor told him that his trouble depended on the bad functions of his lagrymal apparatus and that he needed an operation, which was not accepted by the patient.

On turning the upper lid, the palpebral conjunctivae has the aspect, somewhat undefined, of chronic granular conjunctivitis, but at the same time we saw on the external extremity of the free margin of the lid a small tumor slightly larger than a pea, situated above the lagrymal duct and next to the punctae. The patient stated that for the past three years the tumor had been increasing in size, until its present size, and before that time it was very small and did not bother his vision. On being asked again, he stated that he had had this small tumor since 1868, or for 43 years. On that year he had to leave Cuba for political reasons and on board the ship Dr. La Calle, the oculist recently dead, who was also traveling on the same ship, told him that that tumor would not bother him and would last a great time in growing its then small size.

2. Note sur les concrétions de canalicules lacrymaux by M. V. Morax. Annales d'Oculistique, Vol. 137, p. 188. Soumis de Ophtalmologie. Heidelberg, August, 1907.
3. Mitvalsky. Contribution a la pathologie des canalicules lacrymaux. Section du Ophtalmologie du XII Congress International de Sciences Meicals, Moscou, 1897.

We injected some water with Anel's syringe and the liquid passed on to the throat, but seeing that on pressing the cyst some pus came out by the punctae, we dilated these and the whole contents of the syst came out, which consisted of a kind of small semi-hard peas that had a sebaceous aspect. After the contents of the cyst had been evacuated the tumor disappeared completely. Through the same lagrymal punctae we disinfected the interior of the cyst and the day after, the site of implantation could not be seen and the patient felt well and without any bother at all, as it seemed that the cyst was the cause of the conjunctival irritation. This irritation disappeared in a few days also.

Observation II. E. T. D., a lady 39 years old, consulted us on May 16, 1912, for an affection of her left eye which she had had for the past year. For the last month and a half she has noticed a swelling on the lagrymal punctae, which suppurates and has a bad odor. Carefully examined we discovered a swelling on the level of the lower lachrymal canaliculis of the left eye. The punctae was natural and through it we inserted a silver thread which went in freely, but which brought out a drop of pus on coming out. This made us suspect as in the last case, that there was a passage between the duct and the cyst. We made the dilatation of the punctae as in the catheterization of the lachrymal ducts and when it was ended, the pus and other contents of the cyst came out, the same being identic with those found in the first case, although in smaller quantity as the tumor had the size of a grain of millet.

The patient felt well rested after the operation and the day after had not the slightest trouble and the tumor had disappeared. During two more days some antiseptic injections were put and on the third day she was discharged, completely cured and able to use freely her eye, for reading and sewing things which she could not do well before.

CORNEAL FISTULAE AND IRIDECTOMY*.

Dr. Sameh Bey,

CAIRO, EGYPT.

Fistulae of the cornea, which sometimes complicate asthenic ulcers and retard their cicatrization, present themselves as a small, black point surrounded by a little band of grayish white cicatricial tissue. The anterior chamber is abolished as a consequence of the continual evacuation of the aqueous humor.

The eye itself is softened. The situation of the fistula is often in front of the pupillary margin, or sometimes towards the center of the cornea in front of the crystalline. The corresponding margin of the iris is adherent, sometimes entirely or in part, to the internal opening of the fistula. If this condition persists for a long time, the eye is finally lost. The cornea then becomes flattened, the eye becomes softer and softer, and blindness results from separation of the retina. On the other hand, if the fistula closes, an increase of tension is easily developed, which occasions a new rupture of the less resistant cicatricial tissue. These alternations of permeability and obstruction of the fistula result in softening or increased tension of the eye.

This condition may be repeated for a long time and provoke a serious inflammation. This terminates in the shrinking of the eyeball, which puts an end to the morbid process.

Secondary glaucoma often becomes manifest when the fistula becomes closed after a very long existence.

This evolution proves to us that corneal fistulae are difficult to treat. For the radical cure of these fistulae I have had recourse to iridectomy with great success. This operation merits for its efficaciousness and superiority to all other methods, to be studied thoroughly and described in all treatises and not superficially cited as emanating from certain authors. I do not deny, however, that in certain cases it may be very difficult to execute—in consequence of the absence of the anterior chamber, but with practice one surmounts that difficulty. I wish to refer here to this difficult point of the operation. That difficulty consists in the introduction of the knife into the effaced anterior chamber. To overcome this I introduce the point of the knife only in the corneal limbus, for a distance of a millimeter, so that it may be just visible. After its pas-

*Presented to the Société d'Ophtalmologie d'Egypte at its annual meeting, 1st March, 1913.

†Original communication from "La Clinique Ophtalmologique" of May 10th, 1913.

sage into the cornea I carefully push it parallel to it and the iris for one third of its length. After removing it one can readily draw the iris out of the wound by means of forceps and then excise it.

I have had occasion to practice this operation during my ophthalmological career (22 years) 58 times in the clinic at Calaoun, and 7 times in my private practice, altogether 65 times.

It will suffice to cite here as representative instances the five following cases, gathered in my clinic, the other cases at Calaoun being almost identical; a resume of the whole shall be, however, given in a final table.

Case I. A. Z., boy of 12 years, living in Rue Darb-El-Germamiz, Cairo, came with his mother to consult me in June, 1896, after having been treated by others during four months for a purulent ophthalmia, complicated on the right side with a central ulceration of the cornea extending over the external margin of the pupil.

The ophthalmia, according to the mother's statement, was cured in one month after it first appeared. The following month was devoted to the treatment of the ulcer—the central part of which had cicatrized whilst the external part was transformed into a fistula. This was treated for two months without result. It became healed and reopened alternately. The patient presented himself to me with the eye softened; the cornea a little flattened; the anterior chamber effaced, and the external opening blackish, surrounded by a circle of grey cicatricial tissue. The pressure of the eye caused the aqueous humor to flow out upon the cornea—vision very reduced.

During fifteen days I kept the patient at rest and under the classic treatment; myotics, compression bandage, etc., without good result; the closing of the fistula alternated with its reopening.

On the 25th of June I performed iridectomy upwards, but I confess it was not without difficulty. However, that operation was followed with a good result. Some days after the fistula became cicatrized and the eye recovered its normal appearance and volume. The young patient obtained eventually a visual acuity of one-half.

Case II. Mahmoud Dmar, of Glizeh, a suburb of Cairo; aged 42 years, presented himself at my office in May, 1897, with symptoms of secondary glaucoma. He complained of almost constant pain in the eye and circumorbital region. The eye was injected and hard. The cornea was the seat of a fistula, partially cicatrized, corresponding to the upper border of the pupil. The iris was adherent to the inner opening. According to the statement of the

patient this fistula had existed for more than three months, notwithstanding the treatment adopted alternately by two of our confreres. The oozing from the fistula had stopped for about twenty-days. The glaucomatous symptoms had existed for three days, reducing the acuity of vision to 1/100. I began by instituting the classical medical treatment, but without appreciable result during five days. On the sixth day I performed iridectomy, which has been followed by excellent results with an acuity of 1/3.

Case III. Latifa Ismail, aged 20 years, from Zagazig, of a somewhat delicate constitution, came with her husband to consult me in October, 1902.

Following an attack of muco-purulent granular ophthalmia, which had lasted three months, she had ulceration of both corneæ. That of the left eye became cicatrized after one and one-half months by a central whitish grey maturial. That of the right eye, situated opposite the inferior margin of the pupil terminated in a fistula which developed in a progressive manner. The patient presented herself to me in a very serious condition.

The cornea, perforated by a fistula had a black external opening, surrounded by a circle of cicatricial greyish tissue. The least pressure on the eye produced a flowing of the aqueous humor, which escaped by that opening. The iris was adherent to the internal opening. During two weeks of treatment I witnessed closing and opening of the fistula alternately, and I finally decided to perform iridectomy. I made it from below—the adherent iris being thus released, the amelioration at once made itself manifest and a definite cure was not long delayed.

Case IV. Farag Hussein, living at Darb-El-Ahmar of Cairo, aged 32 years, of feeble constitution, came to see me in September, 1904, for an asthenic ulceration of the right side, almost central and extending somewhat upwards. The ulcer lasted for two months without cicatrization. The patient declared that his trouble had not commenced by any pronounced inflammation. The eye was, however, a little red. The cornea was the seat of numerous small opacities, very light but visible by oblique illumination, the result of repeated attacks of phlyctenular keratitis, which the patient had had several times since his infancy.

In the upper third of the ulcer was seen a corneal fistula in the form of a small black canal circumscribed by an irregular greyish cicatrix, which was a little retracted. The fistula permitted one to see the still transparent membrane of Descemet. My making a lit-

tle pressure upon the globe, the aqueous humor oozed slowly from the canal and moistened the cornea.

I commenced by cauterizing the fistula with a galvano-cautery, followed by myotics and the compress bandage, but as these means proved insufficient, I had recourse, two weeks later, to iridectomy, which produced a radical cure.

Case V. Sayed Ibrahim Achmauevi of Chougra, a suburb of Cairo, aged 40 years, presented himself to me in August, 1907, affected with secondary glaucoma in the left eye, which had repeated itself several times during two months. In the center of an old leucoma was to be seen a small vesicle filled with clear liquid. The injected eye was increased in tension. He suffered rather intense pains in the eye and temples.

These repeated accessions of glaucoma were followed from time to time by a lull during two consecutive months. Without delay I opened the vesicle. Immediately calm was re-established and the patient was at once relieved.

On the next day there was an oozing of the aqueous humor. Some days later, by the use of myotics and other classical means, the fistula was healed up, but the glaucomatous symptoms reappeared. On the 3rd of September I performed iridectomy, which produced a radical cure with a marked improvement of the visual acuity.

It will be seen from what has preceded that iridectomy has a very favorable influence upon the nutrition of the eye. This operation is also efficacious in keratocele, which is simple but persists for a long time, notwithstanding the classical methods.

I am well pleased with this treatment, which shortens considerably the duration of keratocele, and thus renders its cicatrization more easy than with any other methods known to us.

I will enumerate in the following table the other cases which nearly resemble those which I have described:

Adults—	Clinic at Kaloun.	My Clinic.	Total
Men	19	3	22
Women	21	2	23
Children—			
Boys	8	2	10
Girls	10	0	10
	58	7	65

THE SURGICAL TREATMENT OF HIGH MYOPIA.

DR. WALTER EYRE LAMBERT,
NEW YORK.

Having read a paper on the Operative Treatment of High Myopia at the last meeting of the American Medical Association, I feel some hesitancy in so soon again bringing this subject before you, especially as there is nothing really new to offer. My excuse is that I am able to add five successful results to those already published, which have served to strengthen my conviction that the dangers in this operation have been very much exaggerated, and that we are justified in operating upon many cases in which the conditions are such as would be considered by most authorities to be contra-indicative.

The following conclusions reached by A. Hugh Thompson in a paper on the Operative Treatment of High Myopia would seem to voice the general opinion:

1. Degree of myopia suitable for operation. He finds that the average refraction after the removal of the lens may be expressed by a formula my/2+a figure varying between 9 and 13, but averaging 10.5, and considers that in cases above —16D. it is justifiable to operate where there are no other contra-indications.

2. Age. The age limits of his cases were 6 and 25 years. Operation is not advisable over 30, owing to the less ready absorption of the lens matter after needling, and the greater likelihood of degenerative changes in the fundus.

3. Growth of the long axis of the eye after operation is neither hastened nor delayed.

4. State of the fundus. An irregularly defined crescent, or irregular areas of chorioidal atrophy outside the crescent, or macula changes, or vitreous opacities are contra-indications to the operation. He does not consider the operation tends to cause or to prevent choroiditis or macula change.

5. Condition of the second eye. The operation should be done on the eye with the higher myopia, where the amount is unequal. It should not be done where the second eye is emmetropic or diseased.

6. Operative procedure. The author prefers one free needling, followed in nearly all cases by curette evacuation.

7. Visual result. In 17 cases good results were obtained, 10 having distant sight without a glass equal to or better than previously with a correcting glass, and 7 requiring a low plus glass; with

regard to near vision 5 preferred to use the operated eye for all purposes with or without a glass, and 8 the unoperated eye.

8. Question of operating on the second eye. This does not seem advisable in view of possible risks.

9. Possible causes of failure. First group: (1) infection; (2) secondary glaucoma from delayed evacuation or, at a later date, from some obscure cause; (3) cyclitis. Second group: Macular degeneration, chorioiditis and haemorrhage, all of which may occur in the unoperated eye. Third group: Detachment of the retina. In reviewing statistics of other observers, the author is of the opinion that the operation does predispose to this condition in the first year, and in a large proportion of the cases where it occurred there was a loss of vitreous, a point against removal of the lens by linear extraction.

J. G. Cath, in a paper entitled "Final Results of the Operation for High Myopia," says that the operation has no influence on the lengthening of the axis, and that the dangers in high myopia are increased, especially when complications occur at the time of or after the operation. Incipient complicated cataract is a contra-indication. The operation is to be recommended only when the myopia is at least —16D, and a double operation is always to be avoided.

Professor Hess, in an article reviewing the operations in Professor Dimmer's clinic since 1891—67 eyes in all—concludes that in only one case could any injurious effect be ascribed to the operation, and that was a case of infection. He considers the operation entirely justifiable.

Geert concludes that:

1. Axis lengthening in aphakic eyes remains progressive after operation.

2. Axis lengthening is as great in the operated eye as in the non-operated eye.

3. Vision in the operated eye remains constant in a smaller number of cases than in the non-operated eye.

4. The serious complications of high-grade myopia are more numerous in the operated eyes.

5. Operative complications enhance the chance of deleterious myopic changes.

6. The most favorable age is from 16 to 30.

7. The function of the retina sinks more in aphakic eyes than in non-operated eyes.

I have operated upon 14 eyes in 7 patients.

Case I. A female, aged 16 years, with 21D of myopia, vision 20/70 with the correction. The fundi, except for large staphylomata, were healthy. She was operated upon in May, 1906, a needling followed 48 hours after by a linear extraction, and a subsequent discission of the capsule in both eyes. The resultant vision was o. d. 20/30 with +1.50x90, o. s. 20/30 with +1.50+1.50x90, and +3.00 added for near. This patient was seen within the past month; her vision has improved to 20/20 and she has worked as a stenographer ever since the operation. In this case the only complication was that 24 hours after the needling there was a distinct increase in tension and severe pain which was immediately relieved by the evacuation of the lens. No ill effects resulted.

Cast II. A female, aged 31 years, first seen in 1904 and operated upon in 1906. During the two years of observation the conditions had grown steadily worse. The vision was 20/200 with —22, o. d., and 20/100 with —20, o. s. There were extensive changes in the fundi, as shown by this drawing made by Dr. Fridenberg, commencing changes in the lens and floating vitreous opacities. Three needlings were required in the right eye and four in the left, at intervals of two or three days before the linear extraction could be made. The recovery was uneventful. Subsequent discission of the capsules was done, resulting in vision of 20/30 o. d., with —2x90, and 20/30 o. s., with —1.50=+2.50x165; with +3.00 added she reads Jaeger 1. I have seen this patient within six months; the vision has been maintained, and while using her eyes with care, she reads and sews with great comfort. The astigmatism, it may be observed, in this case was against the rule, whereas in Case I it was with the rule. This proves nothing as I am unable to state what the corneal astigmatism was before the operation. The number of needlings necessary may be accounted for by overcaution in the discission, as I feared to create too great disturbance in an eye in which the conditions were so unfavorable. The age of the patient also would have something to do with it.

Case III. A female, aged 26, first seen in March, 1910. Skiascopy showed a myopia of —22D, o. d., and —21D, o. s., with an astigmatism of 1D×180 in both eyes. The vision was 20/70 with the correction. There were floating opacities in the vitreous, more profuse in the right eye, large staphyloma, and a general atrophic choroiditis. Two needlings were required in each eye at intervals of three days and were followed by linear extraction. Subsequent discission of the capsules was done with Weeks's scissors, and the resultant vision was 20/70 with the proper correc-

tion. When last seen, about two months ago, the vision was o. d. 20/40 with —.50=+2×165; o. s. 20/40 with +2×165; +3.00 added for near enables her to read and sew comfortably. She sees so well without glasses that she rarely uses the distant ones. Her only complaint is of the spots in front of her eyes; these, of course, are due to the vitreous opacities which I think have improved somewhat, and I trust will improve still further.

Case IV. A female, aged 50, was first seen in January, 1910. She had always been short-sighted, but her vision had recently failed very rapidly, owing apparently to opacities in both lenses which were so dense that only a very poor view of the fundus was obtainable. The vision was reduced to counting fingers. A colleague who had seen her previously informed me that there were vitreous opacities in both eyes and extensive choroidal changes. The patient then disappeared and I did not see her until the following year. In April, 1911, I made a preliminary iridectomy on each eye followed three days later by an ordinary extraction in the left eye. There was considerable amount of soft lens matter which irrigation failed to remove entirely. A rather dense secondary membrane resulted, upon which I made, four weeks later, a discission with the DeWecker scissors. This did not give a satisfactory opening, but I was then taken seriously ill and was able to do nothing more until November, when a second discission gave a very satisfactory result, the vision being 20/50 with —1=—3×90. In view of the amount of soft lens matters remaining after extraction in the left eye, I decided to do a preliminary capsulotomy in the right eye. Three needlings were done at intervals of two and five days before sufficient change in the lens was produced; two days after the last needling the lens was swollen, the anterior chamber shallow, and the tension slightly elevated; immediate extraction was indicated, but the patient developed a muco-purulent conjunctivitis, which made it unwise to operate if delay were possible. Fortunately no alarming symptoms developed and under treatment the eye was in a condition to be operated in a few days. Recovery in this case was slow and tedious, although only one discission was required on the second eye. The patient left New York in January and at that time her vision was 20/70 with —1=—6×80, o. d., and 20/50 with —1=—5×90, o. s. With +3.50 added she is able to read and sew fairly well. She has been traveling for pleasure ever since her recovery, and I received a postal card from her in Jamaica only a few days ago.

Case V. A female, aged 27, whose sight had been gradually

growing poorer for some time past. The vision in both eyes was 20/70 with —27. The media was clear and except for large staphyloma the fundus was in good condition. The lens of the left eye was needled November 15th, 1911, with practically no result; the second needling, five days later, had very little effect, and a third was done four days later; five days after that a linear extraction was done. The recovery was very slow, the remaining soft lens matter gradually absorbing. Six weeks later a discission of the capsule was made with the Ziegler knife, the resulting vision being 20/50 with —.50=—2×115. Early in May the vision became very much reduced and I found that she had a central choroiditis; at the same time it was discovered that she had a mild form of exophthalmic goitre. Under treatment her general condition improved, and the choroiditis seemed to be arrested. Her vision improved to 20/50 again, and is now 20/50 with —1= —2×120. Because of this complication I naturally hesitated to operate upon the second eye, but finally concluded to do so. The results were most gratifying; two needlings were required, recovery was entirely free from complication, and the final vision obtained was 20/30 with —3.50×60. The discission of the capsule has not been done in this eye as there is a very fair opening; it may, however, seem advisable to enlarge this later.

Case VI. A boy of 8 years, the youngest of my cases, was wearing —14 when I saw him in April, 1912. Skiascopy showed a myopia of —19; the fundus was in good condition and the vitreous clear. The right eye was operated upon in May, 1912, one needling being followed by a linear extraction. The second eye was operated upon in September, only one needling being required in this eye also. Very little or no reaction followed the surgical proceedings in this case. At present retinoscopy shows a hyperopia of 2D and with the Seitz test the vision seems to be 20/50. The child can not read and is decidedly feeble-minded, so that an accurate estimate of the vision is impossible.

Case VII. A male, aged 58 years, the oldest of these cases, was operated upon not primarily on account of the high myopia, but because the lenticular changes were already fairly well advanced. It was impossible to estimate the amount of myopia but from the refraction after the operation I judge it to have been about —15D. The vision in both eyes was fingers at one foot, due to posterior polar cataracts and a general haziness of the lenses. A preliminary iridectomy and a preliminary capsulotomy were followed by a regular extraction in the left eye, and vision of 20/40 with —4=

+3.50×160 resulted. The same procedure was followed in the right eye except that no preliminary capsulotomy was made, for the reason that the nucleus of the left eye was quite large, and I assumed that I would be able to extract the lens in the right eye without a discission. I regret now that I did so as considerable soft lens matter remained, producing an iritis which was troublesome and prolonging the convalescense. The eye is now quiet, and while the vision is only 3/200 I believe that after a discission it will be as good as that of the other.

In all these cases both eyes were operated upon and the results would seem effectively to controvert the general opinion that the second eye should not be attempted. In three of the patients in each eye there were extensive fundus changes with profuse vitreous opacities. In three of the cases, Nos. 2, 4 and 7, cataracts had begun to form, and in cases 4 and 7 had developed to such an extent as to justify an extraction on that account alone. In only three cases, Nos. 1, 5 and 6, were the conditions such as are generally considered to justify the operation—that is to say, the patients were all under the age limit, there were no vitreous opacities, and except for large staphylomata, no choroidal changes. Curiously enough it was in one of these cases that the only complication occurred which might have been attributed to the operation; that was the appearance, six months after the operation, of a central choroiditis in the first eye of Case 5, causing a decided loss of vision which was later regained. As she was then discovered to be suffering from a mild form of exophthalmic goitre it seems quite reasonable to think that this may have been a factor in producing the choroiditis.

Two of these cases, Nos. 1 and 2, have been under observation for seven years, during which time the vision has been maintained and no complications of any kind have arisen. While the other cases are much more recent there is every reason to suppose that their final results will be equally satisfactory.

Although I have been so fortunate in all my cases I do not lose sight of the risk attendant upon this operation, nor do I wish to appear to advocate its indiscriminate use. I believe the Fukala method to be the best in all young subjects; in older ones where lenticular changes have begun I have found it best to make a preliminary iridectomy followed by a preliminary capsulotomy and extraction. I need hardly add that the most careful asepsis should be observed, and that great care should be taken in needling not to puncture the posterior capsule. Above all the patient should be

kept under the closest observation in order that any complication may be deal with promptly.

BIBLIOGRAPHY.

A. Hugh Thomson, Ophthal. Review, Nov., 1916.
T. G. Catle, Archives of Ophthalmology, XLI, 406.
Robert Hesse, Abst. Ophthal., viii, 92.
C. Geert, Ophthalmology, vii, 674.

THE EDUCATION OF THE BLIND*

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OVERBROOK, PENNSYLVANIA.

Dr. Webster L. Fox, Professor of Ophthalmology:

Gentlemen: In presenting Mr. Burritt to you today, I am sure that you will receive much information that will be highly advantageous to you as to the methods adopted in instructing the blind children who, unfortunately, are with us at all times. The Pennsylvania Institution for the Instruction of the Blind, one of the oldest institutions in this country, has always been in the vanguard in the different methods for teaching and educating those deprived of vision. Now, as young physicians, in going out through the country, you will meet blind children who should be sent to an institution where they may be educated by the most approved methods. You will, in advising that this be done, be not only doing good to a grief-stricken family, but greatly benefiting a child.

I take pleasure in presenting Mr. Burritt, of Overbrook. (Applause.)

Mr. Burritt: Gentlemen: I should not consent to take your time or Dr. Fox's, or to give my own, if I did not feel that together, as the result of this hour, we can be of benefit to others in various ways—both in preventing blindness among children and, after this has occurred, in getting the children into schools where something may be done for them.

I shall consider my subject under three heads, as follows:

(1) The prevention of blindness.

(2) Some ways in which you, as physicians, can help us to help blind people.

(3) Some of the methods that we use in the education of the blind.

(1) *The Prevention of Blindness.* Not being a medical man, I have nothing to do with the diagnosis. I shall merely give you the causes of blindness as we have found them at the Overbrook School for the Blind, where we have a card index system, each card stating, first, the assigned cause of blindness, and second, the diagnosis as made by our school oculist.

On this sheet of paper, I have the various causes of blindness

*A lecture delivered to the senior class at the Medico-Chirurgical College, Feb. 28, 1913, at the request of L. Webster Fox, M. D., Professor of Ophthalmology.

ascribed by our ophthalmologist to the pupils who entered our school from 1899 to 1910, inclusive. I shall not take time to refer to all of these, but I ask you to notice that four of the most prolific are: Optic atrophy, traumatism, congenital defects and ophthalmia neonatorum. During this period of twelve years, we received 329 pupils, in twenty of whom the cause of blindness given was optic atrophy. Twenty-two were blind as a result of accidents, and ninety-two were said to be congenitally blind. The most prolific cause of blindness, however, was ophthalmia neonatorum; for of the 329 pupils received, 112, or just about one-third of the entire admissions, were blind from this cause. The statistics on the subject of this disease have been brought down to date, the last figures showing that on December 1, 1912, there were enrolled 207 pupils, of whom 81, or nearly two-fifths, were blind as the result of ophthalmia neonatorum, which, if taken in time, is in most cases a preventable disease. These data are reliable; for our institution, besides being, as Dr. Fox has said, one of the three oldest schools for the blind in the United States, has the most complete records from the beginning possessed by any institution for the blind in this country of which I have any knowledge.

But I am not going to be entirely local in what I have to say regarding this matter. I have here statistics from twenty of the forty-odd institutions for the blind in the United States, for which I am indebted to the Russell Sage Foundation. These figures are for the school year closing in June, 1912, and show that there were 2327 pupils enrolled. Of this number, 684, or only slightly less than three of every ten, were blind from ophthalmia neonatorum. Of the new pupils admitted into these same twenty institutions in the year 1912-1913, 388 in number, 88, 23 per cent, were blind from this cause. You will notice that, according to these statistics, approximately two of every five pupils that reach our school are blind from this preventable disease; and you will not be far wrong in stating that one-third of the pupils enrolled in the schools for the blind in this country are probably blind from this one cause. This does not mean that one-third of all the blindness in the country is the result of ophthalmia neonatorum, as I frequently see it popularly stated; but certainly one-third of the pupils that reach our schools for the blind are there as the result of this disease whose ravages are usually preventable, if promptly treated.

However, we do not entirely prevent other preventable things; and the time will probably never come when we shall not have blindness from ophthalmia neonatorum, as well as from other

causes. We must, nevertheless, co-operate with each other in trying to prevent as much of it as possible, and to help people who have become blind.

(2) This brings me to my second point, *Some ways in which you, as physicians, can help us to help blind people.* In the first place, you can assist us to overcome the prejudice that exists among parents against sending their children away from home to give them the educational advantages afforded by a residential school for the blind. We have literally to beg people to send their blind girls and boys to school. It is not necessary in every case that they should go to special schools, but they certainly ought to be in some school. Our blind children, for instance, are being educated to some extent in the schools with the sighted. You can act as missionaries in urging people to give their blind children the very best educational advantages, as they do their children who see. There are two schools for the blind in our state, that at Pittsburgh, which accommodates one hundred and fifty pupils, and our own, which always has over two hundred enrolled.

Another way in which you can assist is by being particular as to what kind of blind children you send to us. Do not sign the application blank of any child for admission into a school for the blind unless you are sure that he has had everything possible done to restore his sight. It is a mistake to try to educate any child through the finger tips if he can be educated by means of the eye. We never intend to receive into our school anyone who can be benefited by treatment, either medical or operative. On the other hand, however, we never lose an opportunity to benefit a pupil, if one should come to us who has not been properly looked after.

Another mistake often made by physicians is that of signing applications for the admission of *feeble-minded* blind children into our institution. We do often develop pupils who at first sight seem feeble-minded, yet who prove to be backward, their backwardness being due to lack of training; but the clearly feeble-minded ones come to us only to be sent home again, as they are incapable of being educated; they need, and the state ought to provide them, custodial care. You can help us by determining whether a blind child has central nervous trouble; for if he is unmistakably feeble-minded you should urge his parents to send him to ai institution for the feeble-mnided—not to a school for the education of the capable blind.

(3) I now come to the third division of my subject, *Some of the methods that we use in the education of the blind.* First, let

me disabuse your minds of several fallacious notions commonly entertained with regard to blind people. By the word "blind," we do not mean only those who are totally blind. A relatively small number of the pupils in our school are totally blind, according to the strict definition of the oculist—62 of 207, almost exactly 30 per cent of those enrolled December 1, 1912. The remainder see in varying degrees, quite a percentage of those possessing light perception only, which, however, gives them considerable advantage over the totally blind. Yet only those are eligible who must secure their education through their finger tips.

Another fallacious belief with regard to the blind is that on losing their sight people suddenly become musical. This is not so; but particular attention is usually paid to cultivating whatever musical talent a blind person may have, because the blind are the least handicapped in learning music, on account of the fact that this art appeals almost solely to the ear. If we were to spend the same length of time in developing the musical talent of those who see, we should get the same or even better results.

Another popular fallacy is that, no matter how devilish a man may have been when he saw, the moment he loses his sight by some inexplicable and unnatural process he suddenly becomes religiously inclined. The truth is that blind people are no better and no worse than other persons.

It is also commonly supposed that blind persons hear better than seeing people. This merely seems to be the case: the fact is that their ears are better trained and, by virtue of that superior training, are able to interpret more correctly what they hear. Wind or snow is a blind man's fog, because it distorts or muffles sound.

Another erroneous belief is that blind persons count their steps to determine distance and location. They do not. Their feet are so trained that they can interpret the feel of the surface on which they are walking, and this training, supplemented by the trained ear and by other aids which experience has taught them they can rely upon, tells them where they are. For instance, in crossing a street, they are enable to step down and up at the proper places by feeling the fall of the street level as it approaches the curb.

The finger tips of the blind are probably not more sensitive than those of seeing persons. The few studies made here and in Berlin with regard to this subject seem rather to indicate that they are less so. The finger tips, running over the dotted lines in reading, become calloused, and so they are probably less sensitive to touch than the finger tips of the seeing person; so we should say, not that

they are "more sensitive" but "better trained" to interpret the meaning of what they feel.

It has been said that clever blind people can differentiate denominations of paper money by touch. They cannot. What they do is to fold bills of different denominations in different ways and put them in different places in their pocketbooks. Of course, in the first instance, they must trust to some person whom they believe to be honest to tell them the denominations of the bills.

While I have mentioned a number of things that blind people are supposed to be able to do, but cannot do, I must now tell you of some things that they do, but that people would not think them able to do. They play very much like other children. They have their swimming-pool and indulge in various kinds of sports, even baseball and football matches. These games have to be varied somewhat from the kind of football and baseball that you are accustomed to, in order to allow for the handicap imposed by their blindness. In football, we have on each side one boy who can see a little. He does most of stopping of the ball for his side, but all, even the totally blind, take their turn at kicking the ball. I have seen a blind boy follow the ball for seventy-five feet as straight as an arrow, merely by the rustling made by its passage through the grass.

In the education of the blind as in the education of those who see, reading is fundamental. The first book embossed in America for the blind was the Gospel of Mark which was printed at the Pennsylvania Institution for the Blind in 1833. It could be read equally well by the seeing; but its disadvantages were that this type could not be written by the blind and afterwards read by them; nor was it as legible for the general reader. I sometimes think that one of the saddest things about being blind is the fact that one cannot read for himself a letter written in the ordinary way by his seeing friends. This disadvantage of the raised ordinary type which is usually called "line type" led to the development of dotted systems of printing and writing, of which there are two kinds in general use in this country. One, known as American Braille, is built up in dots arranged like this

1 . . 4
2 . . 5
3 . . 6

The other, known as New York Point, is arranged in this way:

135
:::
246

Each system has arguments in its favor; but many persons, including myself, believe that the first, being more open and developing a larger sensitive area of the reading finger than the other, can be read for a longer time with less fatigue than can the second. Another advantage of the former is that the six dots, arranged three vertically and two horizontally, are susceptible of sixty-three combinations; while the same six dots, arranged two vertically and three horizontally, are susceptible of but thirty-nine combinations. Different combinations of dots, in different positions, indicate different letters of the alphabet.

The tablet used in writing these systems consists of two strips of brass, between which the paper is held; and the dots are pricked with a stylus on the wrong side of the paper, beginning at the top and going from right to left, only one dot being made at a time. When the paper is turned over, the raised points may be read from left to right, just like ordinary print. The writing may be done with greater rapidity by the use of a machine, which enables a person to make a number of dots, indicating a particular letter, at the same time, by striking a number of keys at once.

There is also a type for use in mathematics, called the octagonal type, so named because the type is placed in an octagonal-shaped hole in different positions, in order to indicate the different digits.

The blind make good checker players. The checker-board used is sunken a little, and the pieces fit into these depressions.

In order to show the pupils the forms of different objects that are too large to be handled, outline drawings of them are made by means of embossed dots and lines. Their color, of course, cannot be represented, as the blind cannot perceive color. By means of these illustrations, such things as maps, diagrams, etc., may be shown to the pupils. For instance, we taught them in this way the arrangement of the ballot used at the election last fall, the various cuts of meat, the plan and the dimensions of our swimming-pool, and the design of the Cuban flag.

Our endeavor is so to educate our pupils that after they leave us they may be able to make their way in the world without their sight. For instance, one of our graduates who is totally blind, has entered a medical school at Detroit in order to be trained as a general practitioner. There is no reason why a man who cannot see should not be able to diagnose heart or lung disease, for instance. Indeed, there is now a blind heart and lung specialist in the city of Chicago. Providing blind persons are not deficient in mentality, there is no difficulty in educating them to do their work

in the world as well as other people. Let me appeal to you, then, to help to get the children who have no sight into schools where they may be properly trained.

Had we time I could tell you of Francois Huber who, though blind, became the greatest authority on bees; of Henry Fawcett, England's postmaster-general, great and efficient, though blind; of Sir Francis Campbell, the founder and for forty years the eminently successful principal of the Royal Normal College for the Blind in London, England; of David, Wood, the eminent Philadelphia musician, who was blind from childhood; of John E. Swearingen, the wide-awake superintendent of public instruction of the state of South Carolina; of Senator Gore, a man of such broad training and sound judgment that he has already been frequently called into counsel by President-elect Wilson. Gentlemen, if there is nothing the matter with a person except that he cannot see, he can be splendidly educated to take his own place in the world.

SUBCONJUNCTIVAL INJECTIONS OF CYANIDE OF MERCURY IN OPHTHALMOLOGY*

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Of the value of subconjunctival injection in Ophthalmology clinicians are aware, but of the respective merits of the various solutions employed there seems to be no helpful measure.

The question would seem to be whether the beneficial effects were due to the injection or to the chemical; whether the production of lymph stasis or the lavage and consequent elimination, cause disappearance of exudate. Mechanically, since any injection into living tissue increases fluid content and disturbs relations, it must awaken the circulation to restore normal tension. If we imagine virulency to depend on the percentage of dilution of toxins, osmosis alone might act beneficially, but it could scarcely be unattended by phagocytosis.

Certainly water to which is added an infinitesimal amount of sodium chloride must owe its efficiency to increased fluidity, disturbed relations and elimination consequent on their restoration, rather than to the slight increase of an already present agent.

There does not seem to have been any comparative experiments along these lines. Most observers have always used some preparation or combination of one or more of the popular agents, mercury, salt or iodine. There is therefore an abundant literature of remarks, opinions and discussions, but so far as I have been able to find little definitely presented clinical experience. To this Darier is the notable exception in his presentation of the treatment of chorioiditis.

The experience related in this paper was gained at the Amritsar Hospital, India, under Colonel Henry Smith and presents a claim for the use of the cyanide of mercury as being the principal cause of results obtained, and superior to either salt or iodine. More or less full notes were taken on two hundred cases. Many patients disappeared on the second day before examination. A variety of causes make full data impossible there as here. The following is a condensed report:

Condition.	Number Injected.	Good Results.	No Result.
Opacities of vitreous	1	1	
Trachomatous keratitis (pannus)	100	75	1
Ulcers, suppurative	40	35	5

*Read before Ophthalmological section Medical Society of the State of New York, Rochester, April 29, 1913.

Condition.	Number Injected.	Good Results.	No Result.
Ulcer hypopyon	3	2	....
Keratitis ulcerus suppurativa	2	1	....
Corneal opacities (recent)	28	10	....
Keratitis parenchymatous	3	1	....
Sympathetic Ophthalmia	1	1	....
Episcleritis and scleritis	4	2	1
	182	118	9

Besides these a large number of mixed cases of what might best be called irritable eyes were similarly treated. Patients with scarred corneas, diseased lids, more or less ciliary injection, blepharospasm and lacrymation; conditions in which usual treatments are more or less tedious and unsatisfactory.

In all these cases the treatment consisted of a subconjunctival injection of 10-20 minims of a 1-4000 solution of the cyanide of mercury in sterile water.

The immediate effects differed considerably in extent and severity. Generally speaking those showing least oedema, ocular and neighboring, were least benefited and in these a second injection achieved nothing. There was not much complaint although in some cases no cocaine was used; this however, is not the routine nor advisable. In cases injected at the Harlem Eye and Ear Infirmary this has also been true. Applications of heat and cold, whichever preferred by patient, have been used here, but no after treatment was called for in India. Within an hour or so all discomfort disappeared.

The results were very satisfactory. Bleparospasm and lacrymation were promptly relieved. Pain in scleritis and ulcers ceased. Those led to hospital were able to leave alone next day, so far as these symptoms were concerned. This was the cause of my awakening.

Recent corneal opacities were improved. Other remedies may have done as much in these cases, but only after much expenditure of time and attention, both impossible in India.

As a routine for chronic trachomas with pannus, if time and suffering are of moment, cyanide injections hold high place.

In chorioiditis, retinitis, neuritis and retinal detachment, I have no experience worth recording, but in so far as a definite lymphagogue, a known alterative and eliminative and a certain antiseptic

are indicated, the method possessing these qualities should be valuable. The antisyphilitic value should also be considered.

In India the use of the injection was so general that there must have been included cases suitable for other treatment and no doubt some failures were due to mistaken application. The unprejudiced observer, however, was compelled to admit that no treatment could have exceeded the good results in time or simplicity, and for the failure, the experienced clinician would be puzzled to suggest a more likely treatment. The best results were evidenced in those cases where destruction of cornea was imminent and certain, the only hope here being in an instant checking of the process. Most any method will preserve a sightless globe, the eventual scar being the true measure of success. In a large number of cases the injection marked a beginning devervescence.

While the writer does not urge any such routine treatment as he saw and as he would follow in practice in India, he does not consider subconjunctival injection of cyanide as a method of last resort. On the contrary he believes that a wise diagnosis in most of the severe cases of the above group, calls at once for this treatment.

The fact is that many cases of corneal ulceration are doomed by the lax treatment instituted. On first appearance with a casual history, corneal erosions, abrasions and trauma from flying particles of stone, metal or wood, are apt to appear innocent. Cleansing and atropin are generally prescribed. When in twenty-four hours or more these patients return showing increased ulceration and hypopyon, the treatment which has proved of no avail is surely useless in continuation. An injection at this stage commonly gives brilliant results. Later, it, too, is mere procrastination.

The experience was of use and maybe accepted as valid in that it showed availability. There were no cases of "frightful" reaction, no "fearful" results. Untoward accidents such as necrosis, exophynosis, injury of sclera were never observed. The apparent increase of tension was temporary, but it is difficult to be sure of its existence as a result. The tonometer should be used constantly before and after to make any statement useful.

The adhesions often mentioned are said by Indian operators to be temporary and this was certainly true in those where examination was made ten months or a year after injections previous to proposed operation. They would seem to be unimportant in the class of eyes mentioned.

Although in a few cases the redness and oedema were more than

ordinary, the symptoms belied the sensations. Experience at home has confirmed this feature.

What may be considered minor matters by the listener or observer are evidently important. It is, for instance, wise to be sure that the needle point is free between sclera and conjunctiva and not engaged in Tenon's capsule—wise therefore not to inject too near the limbus. It is best to inject only so much in one place as will make a soft bleb; if more is needed, we should use the inferior subconjunctival space. Children seem to stand stronger solutions than the aged. A warmed solution seems least painful.

The cyanide is less irritating, causes less adhesion and does not affect instruments; it is as potent and so discounts the bichloride. Whatever may be the value of salt solution in chorioidal, retinal and neural affections it is not to be compared with the cyanide in the above group.

It should be said again that these cases received no other treatment whatsoever. It is indeed a point of value that these injections obviate constant attention and personal handling, both impossible in India and great trials here.

The report of results in the cases mentioned may be dubbed as too general to be of use. May I answer that it was the number and mixed conditions which rendered the experience fruitful. The old trachomas and pannus with blinding lacrymation and spasm, the ulcers, scleritis and opacities were of the most distressing and dangerous class. They made aside from glaucoma, cataract and trichiasis the bulk of all cases presenting. The impossibility of daily attendance at clinic, the poverty, ignorance and often indifference, rendered one hopeless. A year's work in New York would not give the severe cases of a week in India. It is only under such conditions that one grows familiar with a method of treatment. Too often widely published opinions are based on so small a knowledge that accidents of technique and mistakes in judgments take the place of physiological process and its results.

It is not necessary to become over enthusiastic, neither may one hope to try out cyanide injections in a single case. Each surgeon should test out his own usage and be governed by his own results. It is surely a sterling resource and after a careful consideration of discussions pro and con both here and abroad, in the light of my experience I must tell you that no case has been made against the remedy and that splendid results await its wise use at your hands.

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MANAGEMENT OF HYPERESO AND HYPEREXOPHORIA

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There seems to be no concerted method of procedure among refractionists in cases of hyperesophoria and hyperexophoria.

One method followed is the correction of the lateral error with a prism placed base in or out before one eye and to correct the vertical error with a prism placed base up or down before the fellow eye. This plan is not to be recommended as all heterophorias are binocular, equally divided between the two eyes and should be so corrected.

A second plan followed by some is to correct the error by placing a prism before either eye so that the prism will influence both muscles. These two methods are demonstrated by the following example: With a Maddox rod a patient shows 2°R. hyperphoria and 4° esphoria.

The first method is as follows:

Place before the right eye a 2° prism base down and a 4° prism before the left eye base out.

The second method is as follows:

Place a 3° prism base down and out ax. 30° below the right eye, and a 3° prism base up and out ax. 30° before the left eye. The latter correction is worked out according to the following rule:

Add the amount of the hyperphoria and lateral error together (2+4=6). Divide the result into 90° (90÷6=15°), that is a 6° prism must be rotated 15° to equal in effect a prism of 1°, and as there are 2° of hyperphoria to be corrected the 6° prism must be rotated 30°. The strength of prism needed is to be divided between the two eyes so that a 3° prism is placed before each eye with its base-apex line at 30°.

My attention was first called to this rule by a confrere who had formerly been in the optical business. He tells me that while the rule is not generally applied by opticians that the better class of them are familiar with it and use it. I am sure, if this is a fact, that many oculists may learn. The information gotten through the aid of any appliance that measures the vertical and lateral deviation separately is erroneous, as there is perhaps no position of the eyeball in which a single muscle is concerned but perhaps two or more are used in every ocular movement. The correct amount of heterophoria in combined cases can not be ascertained

unless the total imbalance is measured at one and the same time, for each often influences the other. With a Maddox double prism we can ascertain the true relation of a hyperphoria to an exophoria or esphoria. Place the double prism before the right eye with the base line horizontal. Allow the patient to hold his head in the natural position and elevate or lower the trial frame until vertical diplopia is produced which will occur when the base line of the prism intersects the visual zone. The left eye is now uncovered. A third light is now seen by the patient between the other two. It is well to color this last image by placing a red glass before the patient's left eye. If there is orthophoria the three candle flames will be seen by patient to be plumb and the middle one equidistant from the upper and lower images. Any displacement of the middle flame laterally bespeaks underaction of the muscle of the left eye towards which the light is deviated thus: A displacement of the middle light to the left means underaction of the left external rectus or esophoria. Of course the images seen by the right eye in such a case will be displaced to the right side. If the middle image of the flame is nearer the top or bottom image there is present a hyperphoria called right or left, according to which eye tends to be elevated. If the middle image is nearer the top flame we have R. hyperphoria, if near the bottom flame L. hyperphoria. If the middle image is to the left and above, R. hyp-esophoria, and so on. It is very much easier to diagnose the error correctly remembering that each eye's image is deviated towards the weaker acting muscle. Measure the hyperphoria and the esophoria separately and add the amounts together as above outlined; divide the result into 90° and place prism on left eye with base up and out at the ascertained position. It will be found as a rule that more hyperphoria is shown in esophoria and less in exophoria when measured at the same time and that the inclination and strength of the correcting prisms will be somewhat different. The difference is ascertained by trial. The prism so ascertained is now divided equally between the two eyes and placed before them with parallel axes, but bases in opposite directions.

These tests should always be made with the refraction correction on, as then its influence over the heterophoria will be abrogated.

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CENTRAL SCOTOMA AND BLIND SPOT ANOMALIES—THEIR CLINICAL SIGNIFICANCE

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The posterior pole of the eye is the seat of two areas, both of which are of clinical importance, although they differ widely in the degree of their functional activity; the macula with its fixation point of acutest vision for white and colors, and the optic nerve head corresponding to the silent area known as Mariotte's blind spot. A central scotoma implies a macular lesion, and, excluding of course such obvious introcular conditions as opacity of the cornea or other media, and visible changes, such as hemorrhage or atrophy at the macula, may be considered as pathognomonic of an axial neuritis, often retro-bulbar in origin, and having as its histological basis an inflammation or degeneration of the maculo-papillary fibres. The course of this wedge-shaped system from the temporal side of the disc backward and then more below, and toward the axis of the nerve, is familiar to all. I would merely remind you that the macula receives crossed as well as uncrossed fibres, the former supplying the nasal, the latter the temporal half of the fovea, so that the fixation point is in communication with the visual centres of both hemispheres, that is, the macula has a double representation in the brain. The well known clinical observation of a reservation or sparing (Aussparung of the Germans) of the macula in hemianopsia corroborates this histological finding. A predominant or exclusive involvement of these fibres giving rise to central scotoma at first for colors, and later for white as well, with the ophthalmoscopic picture of pallor of the temporal half of the disc is found in a variety of affections. One large group may be referred to as the toxic amblyopias due most commonly to alcohol and tobacco, but also, it is claimed, to anilin, arsenic, stramonium, lead, carbon dioxide, iodoform, opium, mercury, filix mas, tea, and other drugs. Central scotoma has been noted as an exceptional condition in quinine amaurosis, but as Lewin and Guillery point out, the factor of malaria was probably present and this itself may cause central scotoma. Intestinal auto-intoxication and the specific poisons of systemic syphilis, rheumatism, gonorrhoea, malaria, influenza and erysipelas have also been accused. In another group of cases we have to deal with the pathological factor of accessory sinus disease, especially of the posterior ethmoid and sphenoid sinuses, and while the clinical observations and operative

findings as well as the results of appropriate therapy have been corroborative in cases reported by many observers abroad and at home, the actual modus of the nerve changes has not been determined beyond question. Is this early involvement of the maculopapillary bundle in sinus disease explicable on the basis of a uniform centripetal compression of the optic nerve in its bony canal; in other words, is there a special vulnerability of this group of fibres, or is the condition due to circulatory changes or toxic degeneration? Wilbrand claims that these fibres are more vulnerable by toxines (tobacco, alcohol, etc.), have a finer and thinner medullary sheath than other nerve fibres, and owing to their axial position, have more difficulty in eliminating waste substances such as products of functional metabolism or oftoxic absorption. A direct extension of the inflammation to the substance of the nerve, is of course possible by way of a perineuritis producing an interstitial optic neuritis with loss of sight, but this would be more apt to cause peripheric concentric contraction as has actually been observed. Compression of the central retinal vein where it emerges from the trunk of the nerve, a point which seems to be particularly susceptible to congestion, has been noted in tumor of the sphenoid sinus, and the consequent changes in the nerve were toxic in character, as shown by their correspondence, on microscopic examination, to the experimental lesions produced by acute intoxication with methyl alcohol and filix mas. Central scotoma in intoxication amblyopia is almost invariably bilateral, and while this is the exception in sinus disease, it is by no means unknown, even where the affecton of the accessory cavity is unilateral. The possibility of a central scotoma being present in many cases of sphenoid or posterior ethmoid involvement, is first mentioned by Fuchs and Birch-Hirschfeld, the latter believing that the damage first takes place in the papillo-macular bundle on account of its vulnerability, and that it constitutes one of the early symptoms of infected accessory sinus or of retention.

This is corroborated by Gruenwald, Ziem, Berger, Kuhnt, Bryan, and MacWhinnie. In all of these the latter failed to find a normal field; enlargement of the blind spot being the rule, with isolated scotomata in the intermediate zone, in the cases in which pus was present in the middle turbniate region. In none was a central scotoma demonstrated whether pus was present or not, either before or after operation. In all the cases in which pus, granulation or mucocele was made evident, after operation, there was a characteristic scotoma of the ring or annular type described by De-

Schweinitz, occurring in the intermediate zone, as well as an enlarged blind spot. According to MacWhinnie, the presence of a ring scotoma would warrant the assumption of an accessory sinus involvent, even "when the retained infection was not evident to the probe," and where there is evidence of accessory sinus involvement present by inspection of the naris, enlargement of the blind spot with a relative paracentral scotoma for white is a typical visual field. It seems to me that this differentiation can hardly be maintained in practice, for the determination of the presence of pus in the sinuses before operation may depend on conditions which have nothing to do with the pathology of the case, thus, to cite merely one, the diagnostic ability of the surgeon; in other words, a negative pre-operative finding may mean an absence of pus or a failure to detect it. The visual disturbances must, in the last instance, depend on the character and extent of the pathological changes in the sinuses and cannot logically be expected to correspond to the clinical findings, inasmuch as we know that in accessory sinus disease, the rhinoscopic examination may not reveal disease conditions at all commensurate with the accessory sinus involvement, as demonstrated, later on, by operation.

I am inclined to believe that it is good practice to open the sphenoid in case of an optic neuritis or choked disc, showing paracentral scotoma in the visual fields. In fact, I would go a step further, and advise the same surgical procedure, at least to the extent of opening the ostium of this cavity sufficiently to allow free drainage and permit of lavage, in all cases of blind spot enlargement, central scotoma, or other visual field anomaly of indeterminate origin, even in the absence of choked disc or neuritis. Of course, this presupposes the exclusion of all other etiological factors in the casuation of similar central field disturbances, whether hysteria, tobacco-alcohol intoxication, intestinal decomposition, or brain abscess and tumor.

Foster Kennedy (Amer. Journ. Med. Sciences, Sept., 1911) calls attention to the occurrence of true retro-bulbar neuritis with the formation of a central scotoma and development of primary optic nerve atrophy on the side of the lesion, together with concomitant papilledema in the opposite eye, as an exact diagnostic sign of certain tumors and abscesses in the frontal lobe, namely those in which actual pressure is exerted on the optic nerve. In such cases, the initial papilledema gives way, on the affected side, to retrobulbar neuritis with progressive atrophy. Edema quickly subsides, and visual acuity diminishes rapidly, a central or para-

central scotoma develops, and in a few days time well marked temporal pallor will be seen ophthalmoscopically: an expression of atrophy, which at a later period will be observed in all four quadrants of the disc. Kennedy's conclusions are based on the observation of six cases. In three, direct pressure was exerted on the nerve trunkf rom the very beginning of the disease, so that retrobulbar neuritis was noted before papilledema had had time to develop.

The ophthalmoscopic and visual findings in these three cases make me somewhat skeptical of the exclusive significance of Kennedy's sign, while I do not for a moment doubt its conclusive diagnostic import as an indication of pressure on the optic nerve. Such pressure might well be caused by a distended sphenoid or posterior ethmoid cell, and even without direct pressure, marked congestion, or serious effusion into the nerve sheath, especially if long continued and perhaps accompanied by absorption of septic matter, might produce a retrobulbar neuritis which would in no way be differentiated from that due to neoplasm or pus accumulation in the frontal lobe. The presence of papilledema precedent to the partial optic nerve atrophy, on the other hand, would speak against accessory sinus origin, as bilateral choked disc and the intracranial tension which it indicates, are rare in this class of cases.

The association of this feaure with papilledema is interesting, and of decided clinical importance. It is quite possible that it is not at all infrequent, and has been overlooked, the more so, as careful tests of central color perception are rarely carried out where there is such gross ophthalmoscopic change as choked disc which, too, is often pre-supposed to affect central vision to such a degree as to vitiate the finer tests. It is now well known that this is by no means the invariable, or even the general rule, and that a marked degree of choking is compatible with good sight.

The appearance of a well-defined central scotoma in the course of tabes is an indication of florid syphilis and the expression, not of any incipient primary (tabetic) optic nerve atrophy, but of a partial retro-bulbar neuritis of luetic origin, involving the maculo-papillary bundle only. A central scotoma is frequently found in alcoholic neuritis and in pseudo-tabes of similar etiology, and aids to differentiate this affection from true tabes, in which a macular visual defect is an extreme rarity. Among other morbid conditions causing central scotoma, we may mention multiple sclerosis, acute myelitis, acute anemia from copious hemorrhages, cranial trauma, and fracture of the skull. The intraocular lesion is manifest in

macular hemorrhage, Berlin's opacity accompanying contusion of the globe and commotio retinae, hole at the macula, central retinal embolism, and similar conditions which produce a positive scotoma, which is subjective, i e., recognized as a dark spot by the patient, and generally absolute both for white and colors.

Ring-Scotoma. Retro-bulbar neuritis with annular scotoma is often due to multiple sclerosis. It is often found, too, in hysteria and in neurasthenics who are markedly photoptic, and have dazzling subjective light sensations. A marked irregularity, variation, and tendency to spontaneous disappearance and relapse is characteristic of this class of cases. It is a question, too, in my mind, whether some of the hysterical or neurasthenic cases in which this symptom was noted were not primarily nasal or of accessory sinus origin. There is no doubt that sinus disease, especialy the low grade chronic forms with retention and mild toxic disturbances, will produce a marked and grave nervous prostration or psychasthenia. Whether the latter is due mainly to the frequent and prolonged headaches, or to the effects of poisoning from absorption of decomposition products from the sinuses or nose, is not clear. Gjessing, De Schweinitz and others note concentric ring scotoma in posterior ethnoiditis. Central color scotoma is often the first symptom of an axial neuritis (Birch-Hirschfeld), but according to v. d. Hoeve and de Klejyn, enlargement of the blind spot, at first for color, and later for white, precedes it.

Anomalies of the Blind Spot. Mariotte's spot is located about 15° to the temporal side of the fixation point, corresponding to the actual location of the disc at this angle from the macula. In eyes hyperopic three dioptries or more, the blind spot is further away, up to 19°, while in myopia it is nearer, down to 11°, to the center of the field. The blind spot is usually about ½° below the horizontal meridian owing to the fovea being somewhat above the level of the disc. Van der Hoeve's examination of one hundred eyes of subjects between 18 and 22 years of age shows that the blind spot forms a fairly uniform oval with its greater axis vertical about 5° 43′ horizontal, 7° 26′ vertical diameter, surrounded by a zone relatively blind for white, of½° to ¼°, and this by a zone of relative color blindness, averaging ½°. These campimetric findings at two meters correspond closely with the figures given by Landolt. Enlargement of the blind spot may be due to any intraocular changes which destroy the function of the retina immediately about the nerve-head, as for example, the mechanical pressure in choked disc. Opaque nerve fibers, coloboma of the nerve

sheath, myopic conus or crescent, chorioidal atrophy are obviously to be considered. Aside from these ophthalmoscopically evident causes, enlargement of the blind spot implies loss of function in the peripapillary bundle of optic nerve fibres which are situated immediately internal to the optic nerve sheath, i.e. most peripherally, and supply the retina at the margin of the papilla. It is probable that these fibres are covered by others at the level of the disc, namely those running to the periphery of the retina, so that their degeneration is not immediately signalized by pallor, as is the case where the peripheral fibres are affected, as in quinine amaurosis and other atrophies with predominant involvement of the outer limits, and concentric contraction of the visual field.

Enlargement of the blind spot has been observed as an invariable accompaniment of disease of the posterior accessory nasal cavities, ethmoid and sphenoid, and may be considered almost pathognomonic. Van der Hoeve and De Klejn, Gjessing, Bryan and many others have reported experiences bearing this out. Van der Hoeve considers a horizontal diameter for motion of 7° as too large, and one over 6° as suspicious. This, or a relative color scotoma of more than 1°, should lead to further tests examination. Rapid tiring during tests for determining the limits of the blind spots is itself an important symptom, according to De Klejyn, of partial loss or deterioration of function in the retinal area about the nerve head. The normal eye shows a blind spot of the same size for white, blue and red. De Klejyn cites two positive cases in which operation was insisted on, in spite of negative rhinoscopic findings, on account of the presence of an enlarged blind spot, and two negative cases, shown to be so by operation, revealing free posterior cells. The same author (*Graefe's Arch. f. Ophthal. Aug.* 1912, No. 82) claims that tumors or fracture about the optic foramen without sinus disease may cause central scotoma and enlargement of the blind spot. Pigment changes about the disc are common in hemorrhage and axial neuritis connected with accessory sinus disease (Snellen). The same condition may be found in traumatic hemorrhage into the nerve sheath.

Kuhnt, Onodi, Oertel and others have noted asthenopic symptoms with the visual aura of migraine (scintillating scotoma), and the writer can bear this out from experience in his own case. Beer, as far back as 1817, had repeatedly remarked improvement in eye diseases due to nasal troubles, when free discharge was promoted by sneezing or taking snuff. The usual methods of testing for central scotoma or blind spot anomalies are not sufficiently accurate

when it is a question of closely following and registering the changes in size of a small visual defect, and require much time and patience. The use of campimeters or large black screens at a distance of about six meters is open to the objection that accurate fixation is difficult and cannot be controlled. The usual perimetric tests are carried out with too large test objects. Haitz has advised a method of examination with stereoscopic fixation, allowing both eyes to remain open and be examined independently with minute white and colored test objects, 1 mm. and 2 mm. in diameter. I have modified this test by constructing a graduated scale for the perimeter with squares one degree on the side. The test objects may be exposed and covered instantaneously while the eye of the patient is kept under observation, and accurate fixation assured, or a stereoscopic fixation may be used by means of a pair of spheroprisms with a focal point corresponding to the center of the perimeter arc. I have had these tests arranged for daylight, and for dark room testing with artificial illumination by miniature electric lamp. The visual defects may be plotted on Haitz' charts for the center of the visual field (published by J. Bergmann, Wiesbaden), or on the ordinary perimeter blanks, using an enlarged scale for the macular area.

Even if colored objects, on account of their feebler luminosity, form a much more sensitive test than white ones, they do not suffice to determine the actual extent of a central scotoma, as the absolute types are generally surrounded by a zone of diminished sensibility, in which red, for instance, appears as red-gray or red-brown to black, or with higher illumination gray-red, gray-pink, or gray. It is to a certain extent at the option of examiner and patient, as well, to decide which tint is to be considered as the recognition of red. To obviate this, Groenouw has suggested the use of minute black points or dots, especially for those cases in which even small colored objects fail to reveal a central scotoma, claiming, too, that it is easier to state when a black point or dot is seen, than to determine exactly the tint to which a color has turned. The existence of a zone of diminished sensibility can be demonstrated by using points of different sizes which will show a smaller central defect for a large test object than for a small one.

According to Wilbrand, a progressive course of axial neuritis may be inferred from the following scotometric findings:

1. Extent of relative and absolute scotoma identical, when tested with large objects.

2. Extent of scotoma remaining fixed for blue and white, but increased for red.

3. Fixed extent of red field with the new development inside the scotoma, of a defect for white objects (of any size).

4. Successive disappearance of colors from the visual field or from the region of a scotoma for white in which, previously, color was perceived.

FURTHER EXPERIENCES WITH MY SCLEROTOMIA CRUCIATA MULTIPLEX (GRILL-LIKE SCLEROTOMY).

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(Translated by Dr. C. Zimmermann, Milwaukee, Wis.)

When I devised, a few years ago, a new operation for certain forms of glaucoma, I was guided by the thought, that, if in glaucoma the anterior outlets are free or irrevocably closed, they are not the object of our operative aims. My method was intended for those forms of glaucoma in which iridectomy and anterior sclerotomy fail, viz. glaucoma simplex, and those in which operations had no lasting results. These are certain forms of inflammatory glaucoma, in which the inflammatory symptoms were favorably influenced by iridectomy, but in which vision gradually deteriorated, then secondary glaucoma, in which the anterior outlets cannot be approached. In other words, that part of the eye, which so far has not received sufficient attention, viz. the sclera, ought to be made the object of treatment.

Frequently the sclera, especially of older persons, feels very rigid to the touch, and examinations of enucleated eyes confirmed this by the increased thickness of the sclera. If the sclera becomes rigid it loses its elasticity and forms a resistance in increased intraocular tension, which even in physiological fluctuations must act on the vascular and even more on the nervous parts of the visual organ. Then another element may play a role. The rigid sclera may occasionally, as will be set forth below, close the communication between the suprachorioidal and Tenon's spaces, which perhaps participates in the excretion. The vessels penetrating the sclera, especially the vorticose veins, are surrounded by lympathic sheaths, which connect both spaces. By accumulation of connective tissue, in rigidity of the sclera, these communications are constricted or closed, which may decidedly contribute to the increase of intraocular tension. If this be the case, multiple recticular incisions of the rigid sclera to its deepest layers must make it more expansible, lower the pressure exerted by it and prevent a stasis of lymph in the suprachorioidal space.

It must, however, be emphasized that intraocular tension and rigidity of the sclera do not always coincide, but may frequently show an opposite behavior. The rigidity of the sclera may appear

very intense and the tonometer placed upon the cornea may register no increase of tension, because in this method the sclera is not included. If intraocular tension is increased and the rigidity of the sclera diminished, the increase of tension will be indicated by the tonometer, but not by the palpating finger. I also saw cases in which the cornea by pathological changes had become rigid for palpation, whereas the sclera was atrophic and soft. Here the globe appears less tense to the finger than the other, scarcely altered, eye, and still the tonometer always recorded the same result, viz. a higher pressure of the blind, apparently softer, eye than of the other. Hence follows that the tonometer is not always a reliable

gauge as to the success of an antiglaucomatous operation in rigidity of the sclera. Therefore not only the tonometer ought to be applied, but also the rigidity of the cornea and sclera tested with the finger for the correct estimation of the pathological relations. Thus we may just in those cases, in which there is no decided increase of tension and still failure of central and peripheral vision with excavation of the disc, recognize the rigidity of the sclera as the only cause of it. Here chiefly my operative method proves very useful, perhaps unique, preventing the further deterioration of vision.

Operation: After instillation of cocain a subconjunctival injection of a 1% solution of cocain with adrenalin is made into

the upper temporal region of the eyeball. While an assistant rotates the eyeball far downwards with a sharp hook inserted above the cornea I make a long meridional incision through the conjunctiva. The subconjunctival tissue is lifted up with two pairs of forceps and incised successively to the sclera, the bleeding being controlled by instillations of adrenalin. After the sclera is largely exposed I make with von Graefe's knife from 4 to 6 meridional incisions, 10 to 12 mm. long, into the sclera and as many cross sections, as far back as possible. If the sclera is very thick some of the incisions are deepened, but only from 2 to 3 mm. long, as far as to the chorioid. After irrigations with salt or boric acid

solutions and finally dionin, the wound of the conjunctiva and Tenon's capsule is closed with a few firm sutures and a bandage applied for from one to two days. The patient is not confined to bed. After from four to five days the sutures are removed. Generally the intraocular tension is considerably diminished immediately after the operation, but more so if the eye is massaged, which always ought to be done before applying the dressing.

Later measurements of tension sometimes show that the tension at first rises. But after regular, energetic massage for about two minutes tension constantly sinks, in suitable cases to the normal height to remain normal, with few exceptions, even if massage has been discontinued after weeks.

Disagreeable accidents during the operation, as prolapse of the chorioid, cutting into it or the retina, prolapse of vitreous, did not occur in the whole series of 100 cases. This does not mean that they may not occur, but I believe that they will not influence the effect of the operation. However, they ought to be avoided, and the beginner may place the sutures before making the scleral incisions. Later complications or infections never occurred. Thus I consider the method easy and without danger.

While I devised this operation chiefly for glaucoma simplex, it was also performed in other cases. I may be brief with regard to the indications and results, which I reported in former publica-

tions, e. g. last year in the French Ophthalmological Society. In all my experiments I became convinced that the operation acts favorably whenever glaucomatous symptoms depend directly upon the changed condition of the sclera, glaucoma simplex, or are essentially influenced by it, inflammatory glaucoma, if in spite of regular iridectomy and in consideration of various etiological elements which influence glaucoma after disappearance of the inflammatory symptoms, vision deteriorates. The operation was performed in glaucoma, with iritis and iridocyclitis, if punctures did not help and iridectomy was contraindicated for some reason or other, then in glaucoma in preliminary operation for cataract, hemorrhagic glaucoma, which generally takes a malignant course after iridec-

tomy. Keratoconus and keratoglobus in some cases were benefited by the operation by improvement of vision and decrease of myopia and irregular astigmatism. Also the glaucomatous symptoms produced by dislocation of the lens into the vitreous, in rigidity of the sclera, were favorably influenced by this sclerotomy.

In other words, one may expect results in cases where glaucomatous symptoms, of inflammatory nature or, in simple glaucoma, without these, if the sclera is found rigid. While I was led to this treatment merely inductively I found an essential support for the correct indication of it in the interesting article of Stransky, on the anomalies of the tension of the sclera, which closely deals with the condition of the sclera in age and under pathological influences. Stransky assumes a scleritis indurativa, antica, postica, and universalis, which by itself or with other elements exerts a deleterious influence on the interior of the globe by a centripetal motion of the sclera and diminution of the eyeball. While the anterior indurative scleritis by influencing the anterior outlets may give rise to inflammatory glaucoma, the posterior scleritis acts on the excavation of the disc in a very plausible fashion minutely described by the auther. Although I do not concede that a regular scleritis exists in most cases and rather assume an essentially indurative process without inflammation, there are cases in which one may directly speak of scleritis, as the sclera has actually become hyperemic as shown by the operation. Certainly age and sclerotic diseases create pathological changes of the sclera, which thereby loses its elasticity, and by increasing rigidity produce disturbances of circulation or dislocations of the lamina cribrosa with its deleterious consequences for the optic nerve. Induration of the sclera may be combined with increase of intraocular tension, so that inflammatory glaucomatous phenomena ensue, which do not yield to the operations en vogue. It also may exist without appreciable increase of intraocular tension and still may lead to excavation of the disc with its sequels. Thus we get the peculiar clinical picture of amblyopia or amaurosis with excavation of the disc that leads to disorders in the optic nerve merely through the induration of the sclera, which narrows the scleral canal and generally displaces the also indurated lamina cribrosa backwards. If we wish to check these disturbances and remove their cause, respectively control their consequences in time, we must apply the lever here, and for this the described procedure, thoroughly tested by me, seems to be the most suitable. I do not consider my operation as

a panacea for any form of glaucoma. Like all others, it surely may frequently fail, but before all I may claim for it that it is perhaps the only rational method against glaucoma simplex.

A MODIFIED ELECTRIC BULB.

James Cole Hancock, M. D.,

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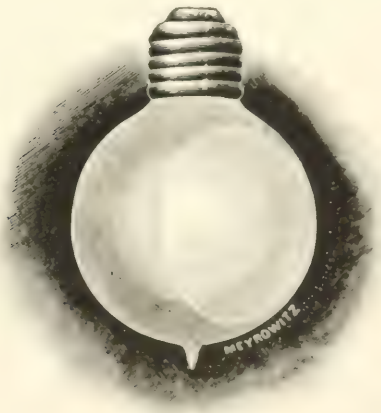
In making ophthalmoscopic examinations with the aid of the electric bulb which is in general use much annoyance is caused by the presence of the image of the carbon filament projected upon the fundus, as this interferes with determining exact details. To do away with this confusing element it has occurred to me to have the transparent window of the bulb *lightly* frosted. Through this light frosting sufficient light passes to enable one to make a perfectly satisfactory examination, with the image of the carbon entirely eliminated. A much more effective concentration of light may be obtained by covering all but the lightly frosted window of the bulb with some dark material, such as a bronze or black composition. The mechanical details of both of the ideas mentioned have been carried out by the E. B. Meyrowitz Company, of New York.



Abstracts From Recent Ophthalmic Literature

AMBLYOPIA AND BLINDNESS

A Case of (Hysterical?) Sudden Monocular Real Blindness With Recovery.—Tuckerman, W. C., Cleveland (*Cleveland Medical Journal,* February, 1913). The patient, a woman aged 45, reported many peculiar symptoms and sensations described by the writer, for some time before she came under his observation, at which time she had been totally blind in the right eye three or four days. All tests, including the prism light displacement test, showed blindness actually present. The blind eye always followed the prism displacement of the seeing eye. The right disc showed slight paleness and a crescent on its temporal border and also several pigment streaks about its border; the blood vessels appeared normal. The vision of the left eye with correction was 20/20, and its fundus was normal in every respect, not even showing pigment spots. Three days after having first seen patient perception of light began, and two months later the vision with proper correction worn was 20/20. A Wasserman test was made with strongly positive findings, but improvement began before anti-syphilitic treatment was begun. therefore the writer considered the case one of hysterical blindness, with the possibility of syphilis being an underlying factor. A similar case described by another writer is mentioned.

M. D. S.

A Case of Acute Bilateral Retrobulbar Neuritis With Amaurosis for 33 Days. Recovery.—Augstein, C., Bromberg (*Klin. Mon. f. Aug.,* 51, I, February, 1913, p. 181). An otherwise healthy man, aged 38, who had some years ago otitis media and a nasal affection on the left side, became blind within a few days under very severe headache on the left side, without any ophthalmoscopic changes. Opening of the ethmoidal and sphenoidal sinuses revealed normal conditions. Before the amaurosis was complete the visual field of the left eye was preserved in the upper nasal quadrant, and after this was abolished the sight of the left eye failed rapidly, with general contraction of the visual field and central relative scotomas, but in such a manner that the perception in the temporal half was more diminished. Although Wassermann was negative, the patient received energetic anti-syphilitic treatment with mercurial ointment, iodid of potassium, one injection

of calomel oil and two injections of arsenobenzol, but without the least result after 35 days. Then all medication was discontinued and the patient removed from the clinic to his residence. On the 33d day perception of light returned and vision gradually became restored. Three months later it was R 5/4, L 2/15. With the beginning improvement the visual fields showed the typical character of those of retrobulbar neuritis with central scotomas for color, which gradually disappeared.

A. considers the affection as idiopathic retrobulbar neuritis due to autointoxication, which healed spontaneously, and excludes a syphilitic process, which would have responded to such energetic treatment much earlier. The severe headache and the lack of pain in extreme movements of the eyes indicated an intracranial localization of the inflammatory processes. Hence no changes of the discs, excepting a very slight pallor of the temporal half of the left disc, were noticed at the last examination two years later. With regard to treatment A. says that acute retrobulbar neuritis takes a typical course, which also is characteristic for toxic influences, and is not likely to be altered by medication. C. Z.

On Epidemic Idiopathic Hemeralopia. — von Hebbenschwand, F. (*From the eye clinic of Prof. St. Bernheimer in the University of Innsbruck. Arch. f. Aug.*, 73, p. 133), reports on his observations on hemeralopia in 54 men of the same regiment, of Polish and Ruthenic nationality. They were small, delicately built, but strong, between 22 and 24 years old, of marked slavic type. Excepting seven they all had at home been working on farms, where they lived chiefly on vegetables. The majority came from large families. In many of these several children had died in early infancy of unknown diseases. In the older cases the hemeralopia had developed a year ago, in the more recent ones a few weeks previously. Twenty-two noticed a sudden, the others a more gradual development. Physical strain and glaring by the sun aggravated the condition. Nine were emmetropic, 30 hypermetropic, 13 slightly myopic. The fundus presented in general no pathological changes. In six the disc was slightly discolored and the retinal veins lighter (anemic fundus). The visual field in daylight was normal for white, contracted for blue, in the dusk also for white. Four men had red-green blindness. Wassermann's reaction was positive in four.

The general examination revealed one peculiar condition: Fifty-one out of the 54 men had enlarged lymphatic glands at the neck,

arm pit and groins, but no changes of the spleen. Microscopically the blood showed an augmentation of the small lymphocytes, the large mononuelear cells and the forms of transition, a decrease of hemoglobin to 60%, and poikilocytosis. As the nourishment was good and plentiful and the same as of the other regiments of the same garrison, who underwent the same physical exertions and were in equal manner exposed to glaring of the sun, v. H. attributes the affection to individual predisposition from hereditary influences. This was evident from the swelling of the lymphatic glands and the increase of lymphocytes. He considers as the eliciting element for hemeralopia the slight degrees of anemia, indicated by the decrease of hemoglobin and the poikilocytosis. Such anemia may disturb the functions of the retina, especially if combined with external influences, as physical exertion and glaring by the sun. C. Z.

BACTERIOLOGY.

Procrastination in Diseases of the Eye.—Stoll, K. L., Cincinnati, Ohio (*Jour. Ophth. and Oto-Laryn.,* July, 1912.) This is a plea for microscopical examination in every case of infectious conjunctivitis in order to outline the proper treatment and incidentally adding interest to our work. Procrastination is to be blamed for many cases of amblyopia, exanopsia and strabismus.
G. I. H.

On Non-Gonorrhoic Ophthalmoblennorrhoeas of the Newborn and Infants.—Crede-Hoerder, C., Berlin-Friedenan (*Deut. Med. Woch.,* January 9, 1913, No. 2, p. 74), thinks that a microscopic examination in many cases would show that the diagnosis of gonorrhoic ophthalmoblennorrhoea is made too frequently. The non-gonorrhoic form presents the following aspect: Agglutination of lids, redness of the lid border and their surroundings, moderate edematous swelling of the upper lid, purulent or sero-purulent secretion, redness of conjunctiva, thin deposits on the palpebral conjunctiva, cornea clear. Its course differs very much from the gonorrhoic form by the intactness of the cornea and the scanty, more serous, secretion. Microscopically C. found Fraenkel's pneumococci, and bacteria coli. The treatment in his cases consisted in irrigation with boracic acid solution and in a more severe case of pneumococci blennorrhoea, which commenced on the eighth day, in instillations of acetate of silver 1.3% on the first and fifth days. C. considers the careful treatment of the otherwise harmless non-gonorrhoic ophthalmoblennorrhoea of great im-

portance for preventing later chronic conjunctivitis, which may be very difficult to cure. C. Z.

Chlamydozoa in Natatorium-Conjunctivitis.—Hentemueller and Paderstein (*From the institute for infectious diseases and the eye polyclinic of Dr. Paderstein at Berlin. Deut. Med. Woch.*, January 9, 1913, No. 2, p. 63), report a series of 44 cases of acute conjunctivitis of striking resemblance to acute trachoma. The patients had all bathed in a public natatorium. Only the fact that in short succession two attendants of the same swimming bath were affected aroused the suspicion of a natatorium endemic as described by Schultz and Fuchs. The infectious nature of the disease was proved by its transmission to monkeys. The secretion contained typical cell inclosures very similar to the chlamydozoa found by Halberstaedter and Provazek in trachoma.

Further investigations must decide whether this affection is a disease proper or real, although weakened, trachoma. The authors incline to the first assumption. The natatorium-conjunctivitis does not always heal completely, but may leave changes which also occur in trachoma, e. g. ptosis. It must, however, be emphasized that of the two pathognomonic symptoms of trachoma the most important, viz. cicatrization, was found in no case and the significance of pannus in one patient was doubtful. The water of the natatorium is daily renewed and the tank is thoroughly washed with antiform solution once a week, so that it may be supposed that all morbid agents are destroyed. Hence the contagion could only occur through bathing water which has been recently infected.

C. Z.

CATARACT.

Death After Cataract Operation.—Bernstein, F. J., Kalamazoo (*Ann. Ophth.*, April, 1913). A physician aged 76 was operated upon for mature nuclear cataract in one eye. He was apparently sound physically. The operation was with iridectomy and went smoothly. The unoperated eye was uncovered on the second day and the operated eye on the eighth day. He was sitting up on the second day and was allowed to walk about his room on the eighth day. On the twelfth day indefinite shoulder pains developed, which yielded to aspirin, but which returned in other joints. One month after operation and after a period of [illegible] from pain he became demented, and this condition persisted for a fortnight, when at the request of his sons the eye was enucleated, notwithstanding it was in good condition. There was no remission

of the symptoms and two months after the primary operation the patient died.

The experience of well-known operators in this country and abroad was asked, which resulted in the report of forty-eight cases of death following cataract operation being reported. The author believes that fear is largely responsible for the physical condition which causes death in these cases, and that every precaution should be taken to minimize it by having the patient become familiar with the hospital surroundings, by having him enter a few days before the operation is performed. Positive assurances should be made to the patient of the success of the procedure and as little bandaging as possible should be done. The patient should not be confined to bed but a very short time and the diet should be non-stimulating and alkaline waters should be given freely before and after the operation. The forty-eight cases of death reported are reviewed in detail. He also reports a case of death following an operation for extirpation of the lachrymal sac done upon an elderly lady under morphine-scopolamin anesthesia. She was operated upon the morning she went into the hospital and remained in a stupor for two days following the operation, when it was discovered that she had right-sided hemiplegia and death took place that afternoon. The author thinks the shock of going into the hospital and rapid preparation for operation caused such an alteration of blood pressure as to cause a brain hemorrhage, and that this had occurred before he operated. M. B.

Operation for Senile Cataract.—Jennings, J. Ellis, St. Louis (*Jour. Missouri State Med. Association,* March, 1913), reviews the usual procedures used in determining the advisability of operating. He finds it of great advantage to have the patient take 10 grains of salicylate of soda three times a day for a week before and a week after operating. The night before the operation the patient is given two grains of calomel, followed on the morning of the operation by a saline laxative. He emphasizes the need of asepsis and discusses the various steps in the cataract operation.
M. D. S.

Intracapsular Cataract Operation From the Viewpoint of an Assistant.—Millette, J. W., Dayton (*Ohio State Med. Jour.,* April 15, 1913). The writer emphasizes the need of the assistant having a thorough knowledge of the mind and manner of the operator, also of the mental preparation of the patient. He

believes preliminary iridectomy is not wise in this operation, for the reason that the edges of the iridal wound may become adhered to the endothelial edges of the incision, or to the capsule itself, and thus seriously hinder the accouchement of the lenticular body. Also, the iridal wound heals and the cicatricial edges are not so elastic as the non-cicatrized wound, which makes the delivery more difficult. Again, it requires a second operation, which violates one of the principal claims of superiority for the intracapsular operation. He describes carefully the function of the assistant in using his hands and lid hook at different stages of the operation in order to be of the most service in giving the operator a good view and to prevent any untoward occurrence. M. D. S.

Hereditary Cataract—Five Cases.—Campbell, James A., St. Louis, Mo. (*Jour. Ophthal. Otol. and Laryngol,* April, 1913). These five remarkable cases consist of the father, two sons, one daughter and a niece, each of whom developed cataract in both eyes between the ages of 25 and 29. Previously the vision had been normal, as evidenced by perfect vision in one eye of each of the boys, which later became involved. The family were remarkable for their size and perfect physical development. The cataracts developed without pain or inflammatory symptoms. The author operated upon both eyes of the two boys and one eye of their sister with perfect visual and cosmetic results. The father was 72 years of age and had been operated upon when he was thirty. In both eyes there had been an upward iridectomy. The pupils were small, drawn upward and dimmed by dense spider-web like lines. R V w+8 was 15/100, left had light perception. The vision of right was improved to 15/50 by a needling. The cousin of this group was a woman of 40. She was paralyzed and bed ridden, when a girl had "sore eyes," and the right eye was removed. The left eye had been blind for a number of years and showed constant nystagmus, a chronic conjunctivitis, with an atrophied nuclear cataract, light perception nil. No ancestral history could be obtained, as they had emigrated to this country when very young. M. B.

General Anesthesia in Cataract Work.—Heiss, Max C., San Francisco, Cal. (*Jour. Ophth. and Oto-Laryn.,* December, 1912). This is a plea for the use of a general anesthesia like nitrous oxide gas with oxygen. The author gives the history of five cataract extractions with the ether anesthesia. The author extracts the cataract with his vacuum method and states the

wound with silk. Hulen insists upon a profound anesthesia. With the general anesthetic he also uses cocaine and adrenalin solutions. "Cocaine has a tendency to lower the tension of the eye." G. I. H.

A Method of Dealing With the Capsule After Cataract Operations.—Reeder, D. F. (*Ophth. Record,* April, 1913). The author describes the operation as follows: With a dilated pupil and after the usual preliminaries, an eye needle $1\frac{3}{4}$ to 2 mm. wide is passed through the cornea near its margin and on the opposite side of the eye, and passes through the capsule just beneath the iris. This frees the capsule from the iris and prevents its laceration in the next step of the operation. The needle is then withdrawn without the loss of fluid. Next, a small hook, similar to Tyrrel's iris hook, the curve of which is 1 mm. wide, which enables it to pass through the opening made by the needle, is used. The point of the needle is reasonably sharp, and points almost, but not quite, horizontal to the shaft. This hook is passed through the opening in the capsule made by the needle. Traction is then made on the hook until it is near the proximal margin of the iris, when the point of the hook is turned up so that the point passes over the edge of the iris and through the capsule, insuring a firm hold. It is then withdrawn and the operation is complete. The iris and the ciliary body are not disturbed, and there is practically no after effects. G. I. H.

CHORIOID

A Case of Unusual Atrophy of the Chorioid.—Chance, Burton, Philadelphia, Pa. (*Ophth. Record,* January, 1913). At about a diameter from the disc was a sharply outlined circular area of complete chorioidal atrophy, and at nearly one diameter to the outer side of this area there was another nearly as large and equally as sharp cut and circular. The smaller area was on a somewhat lower plane than the other, and involved the macula; over the upper border the macular depression shone like the glow above the horizon at early sunrise. It is not unlikely that the areas were formed by emboli invading the choriocapillaris in these regions. There were no signs of disease in the right eye. G. I. H.

CIRCULATION.

The Effect of Chronic Glaucoma on the Central Retinal Vessels.—Verhoeff, F. H., Boston (*Arch. Ophth.,* March, 1913. XLII, 145), summarizes his findings, as to the changes present in the central retinal vessels, in a series of 39 cases of secondary glau-

cona. His material consisted of eyes from cases of secondary glaucoma due to lesions of the anterior portion of the globe, and all cases were excluded where the clinical records indicated any probability of primary glaucoma in either eye.

Microscopic examination showed that in all cases one or both of the central vessels were affected with endovasculitis, in the region of the lamina cribrosa. In general the vein was the more greatly affected of the two central vessels. The primary change was evidently subendothelial cellular proliferation with formation of connective tissue.

The author considers three factors in explanation of why the central retinal vessels should be so markedly affected in secondary glaucoma; namely, the direct action of the increased intraocular pressure on the retinal vascular system, the action on the central vessels of toxic substances resulting from the relative stagnation of the intraocular fluids, and the traction on the vessels produced by the receding lamina cribrosa. He considers the first to be the most important factor.

The author gives the following conclusions:

"Secondary glaucoma produces, sooner or later, endovasculitis of the central retinal vessels, leading ultimately to complete obstruction of both. The same variety of changes are seen as in cases of primary obstruction of these vessels. Thrombosis does not occur. Dissecting aneurisms not infrequently occur in both the vein and artery, producing complicated appearances which have been mistaken for canalized thrombi.

"Obstruction of the central vein due to secondary glaucoma, probably owing to its slow development, seldom if ever produces the intense hemorrhagic retinitis often seen after primary obstruction of this vessel.

"In chronic primary glaucoma, endovasculitis of the central retinal vessels, where not coincidental, is the result, not the cause, of the increased intraocular pressure. In the majority of cases it probably does not reach a sufficiently high degree to impair vision until the latter is already lost from other causes."

The article is illustrated. W. R. M.

Relations of the Vascular System to Certain Ocular Diseases.—Wilmer, Holland William, Washington, D. C. (*Journ. of Ophth. and Oto-Laryn.*, April, 1913). The author includes arterio-sclerosis, albuminuric retinitis, diabetic retinitis and diabetic amblyopia and tobacco amblyopia. Various poisons circulate in the

blood, causing amblyopia, such as methyl and ethyl-alcohol, iodoform, quinine, salicylic acid, etc. These poisons act in different ways; ergot, etc., by causing retinal ischemia. Some poisons, like lead, affect the eye secondarily through the kidneys. Other medicines, like salicylic acid, affect the sight, in all probability, by a direct action upon the cerebral centers. The author gives three cases of uveitis due to infection from the intestines. G. I. H.

The Significance of Arteriosclerosis in the Fundus Oculi.—Hill, Emory, Chicago, Ill. (*Jour. of Ophth. and Oto-Laryn.*, January, 1913). The retinal vessels, more often than not, are the seat of early and extensive sclerotic changes, and their appearance may be pathognomonic when the stethoscope, the palpating finger and the sphygmomanometer do not elicit the classic symptoms of the disease. The general cloudiness of the crystalline lens, or its differentiation into sectors. The author concludes with "the important service of the ophthalmologist is in the early stages of arteriosclerosis when the damage already done is slight." G. I. H.

Early Fundus Signs of Arteriosclerosis.—Greenwood, Allen, Boston (*Ann. Ophth.*, April, 1913). The importance of recognition of early signs of this condition makes it possible to stop the progress of the disease in many cases. The subjective symptoms are not conspicuous, sometimes the complaint is made of slight dimness of vision, and inability to use eyes for prolonged work. The most characteristic symptom is the complaint that the middle letter of a word is blurred, irregular in outline, slightly misplaced, or momentarily absent. He regards spasm of retinal arteries with transient loss of vision as also an early symptom. The very early fundus changes are bending of the veins where the arteries cross with slight dilatation of the vein on the distal side of the crossing, inability to see the underlying vein and a broadening of the light reflex on the artery. An equally early sign is, as pointed out by de Schweinitz, the corkscrew vessels near the macula, often accompanied by a few macula dots. A slightly congested appearance of the disc is also an early sign, the edge of the disc and surrounding retina also shows a filmy appearance. This appearance may extend along the course of the vessels and be present in various parts of the retina as a local oedema, and later these areas may show spots of degeneration. Another early sign is yellowish-white spots of chorioretinal disturbance. Another associated condition is slight hollowing of the disc, with the vessels sloping from the edge to-

ward the center. On finding one or more of these early signs the blood pressure should be taken, as it is highly probable that it will be found to be increased. M. B.

Ocular Tension and Its Relation to Blood Pressure.—Ilbershoff, A. E., Cleveland, Ohio (*Journ. Ophth., Otol. and Laryng.*, February, 1913). Every increase or decrease in blood pressure results in a corresponding temporary alteration in the ocular pressure. This temporary change is quickly compensated for by a reciprocal alteration in lymph excretion, so that the volume of the ocular contents remains fairly constant. The intraocular fluids are the result of an osmotic process through the ciliary processes. There are no lymphatics in the eye and the iris and vitreous have no secretory function.

Permanently increased tension is not due to high blood pressure directly, but may co-exist with it only in the absence of adequate compensation. Five cases are reported in illustration. High blood pressure in a person having a small cornea or a large lens are predisposed to glaucoma. It requires but an agency to upset the balance of secretion and excretion. He thinks that sudden lowering of the ocular tension by opening the eyeball subjects the eye to the danger of hemorrhage. He thinks blood pressure should be lowered first.

He thinks that senile cataract is due to an osmotic unbalance, the vitreous and aqueous being either hypertonic or hypotonic to the lens. He thinks the presence of an increased amount of sugar in the ocular fluids in diabetes may explain the frequency of cataract in such subjects. In the presence of increased blood pressure the ocular fluids have a higher specific gravity and he thinks these fluids being hypertonic to the lenses causes it to shrink and become opaque. The author believes that further studies along this line will show that the regulation of blood pressure will prove a valuable method of non-operative treatment of glaucoma and cataract. M. B.

CONJUNCTIVA.

Vernal Conjunctivitis.—Meyer, R. B., Cincinnati (*Cincinnati Med. Journ.*, January, 1913). The writer states the opinions of many noted and careful students of this disease. He discusses at some lengths its pathology and the various phases in which it appears. He directs especial attention to the nature of the secretion and mentions cases coming under his own observation where the percentage of eosinophiles was 50 in one and 27 in another. He

says, "As to cause—atmospheric heat, ultra-violet rays, and bacteria, have each had their supporters." Under treatment he mentions means for absorbing the ultra-violet rays as euphos glass or probably better chemical means for this absorption as the instillation in the conjunctival sac of a solution of the monoxyderivate of aesculin. Adrenalin, astringents, the X-ray and many other remedies have been tried, but none have gven uniformly good results. "Very brilliant results have, however, attended the employment of radium, and at the present there seems no other method of treatment which can be so relied upon for almost certain curative effects as the exposure to its rays." M. D. S.

Treatment of Vernal Conjunctivitis.—Brav, Aaron, Philadelphia (*Therapeutic Gazette,* April 15, 1913). The writer does not think this disease can be definitely attributed to the ultra-violet rays. He is inclined to the theory that the disease is caused by some germ that comes with the growth of some flower or grass affecting those predisposed to the disease, somewhat analogous to hay-fever. He says the gelatinous discharge is pathognomonic of the disease. The brownish and sometimes blueish brown tint of the bulbar conjunctiva is also very characteristic. The absence of a congested conjunctiva is an important diagnostic point in differentiating this disease from trachoma. The writer has not observed the so-called milky membranous cover which is usually mentioned. He discusses the disease under three distinct types: 1, the conjunctival; 2, the bulbar; 3, the corneal scleral. The treatment is palliative. Cold applications applied daily give considerable relief. Routinely he gives at the first visit a mild astringent and also prescribes argyrol. He thinks the best local application in the office is a 25% solution of boroglyceride. A week or two later a lotion containing boric acid, adrenalin, holocain and camphor water is prescribed and also a 5% boroglyceride solution. Surgical interference is only exceptionally warranted. M. D. S.

Etiology of Phlyctenular Conjunctivitis.—Knorr, E. A. (*Maryland Med. Jour.,* April, 1913). The writer reviews the literature on the cause of this disease and discusses particularly etiology from three different viewpoints: 1, bacterial inflammation and its allied condition, eczema; 2, the exudative diathesis; 3, indicanuria. Different micro-organisms have been isolated in this disease, but none has been found characteristic. Stephanson found among 669 cases of phlyctenular conjunctivitis 53% affected with eczema.

Some observers have found indican in the urine in a large percentage of cases, while others have not found this condition present in but a very small percentage. The experiments of many research workers along this line are described, and they appear to demonstrate the tubercular nature of this disease. "Concerning the question whether phlyctenular conjunctivitis is always a sign of tuberculosis, it can be answered by the statistics of Axenfeld, Weeks, Bednarski, Beers and others, who found from 88% to 100% of their cases reacting to the von Pirquet test." "There can be but little doubt that the recurrent phlyctenular disease of children depends upon a tubercular infection." M. D. S.

On Conjunctivitis Petrificans.—Sidler-Huguenin, Zürich (*Arch. f. Aug.*, 73, p. 167), reports in great detail the clinical history of an hysterical girl, aged 16, otherwise healthy and of good family, who with the greatest cunning in preventing detection inflicted to her eyes artificial conjunctivitis petrificans. She seemed to relish pain by introducing different kinds of lime into the conjunctival sac, grinding them with the lid, by scarifications of the conjunctiva with a needle, and contusions of the lids with subsequent sugillations. H. says that if one compares this case clinically, chemically and anatomo-pathologically with the few typical cases of conjunctivitis petrificans published (8 in all), one must concede that the not artificial and the artificially produced conjunctivitis petrificans may present identical results. He concludes from his experience that if greater attention will be paid in the future to the most incredible possibilities of an artifact, the typical not artificial conjunctivitis petrificans, in which the white spots of lime, frequently many millimeters large, were renewed from one day to the other, leading to regular crusts of lime within a few hours, may disappear from literature as a clinical picture. C. Z.

Conjunctivitis Diphtheritica, Diphtheritic and Croupous.—von Hoor, Carl, Budapest (*Klin. Mon. f. Aug.*, 51, I. März, 1913, p. 333), urges strict adherence to the proper use of these terms, which signify different affections. Diphtheritic and croupous conjunctivitis are anatomo-pathological diagnoses, diphtheria of the conjunctiva is an etiological diagnosis and only applicable if in the diphtheritic or croupous conjunctiva Loeffler's diphtheria bacillus is found. Diphtheritis and croup of the conjunctiva may also be caused by other micro-organisms, chiefly streptococci, but then the affection cannot be called diphtheria. Croupous conjunc-

tivitis is characterized by the formation of pseudomembranes, which can be removed more or less easily, so that the conjunctiva presents a red, swollen surface with inclination to bleed. Diphtheritis consists in a copious exudation into the tissue, giving the conjunctiva a dirty gray appearance, which cannot be removed. Thus the clinical examination allows only of the diagnosis croupous conjunctivitis or diphtheritic conjunctivitis, and the bacteriological examination must determine whether the croup or the diphtheritis of the conjunctiva is also a diphtheria of the conjunctiva or not.

Then v. H. reports a case of diphtheritis of the conjunctiva from infection by streptococci in one eye of a boy, aged 1 year, which led to destruction of the cornea, and pseudomembranous conjunctivitis of the other eye, also from infection by streptococci, which healed after five months. Soon after the birth of the otherwise healthy child of healthy parents a suppuration of the navel developed which lasted for three months, followed by abscesses of the lymphatic glands of the neck, which were opened and slowly healed after several months. The right eye became inflamed three weeks later and then, after a few days, the left eye.

The infection of the navel by streptococci may have been ectogeneous, that of the lymphatic glands and the conjunctiva of hematogenous origin. The mother suffered during gravidity from repeated attacks of follicular angina, i. e. infections by streptococci, so that the suppuration may have been congenital, due to a streptococcus infection from the placentar circulation. C. Z.

CORNEA.

Points in the Treatment of Corneal Ulcers.—Wray, Charles, London, England (*Ophth. Record,* May, 1912). In the author's practice to a very large extent antiseptic lotions have been replaced by normal saline solutions. This is a plea for more active prophylaxis. G. I. H.

Infectious Suppurative Keratitis.—La Mothe, E. A., Chicago (*Ophth. Record,* March, 1913.) The author gives the following types of keratitis: The typical serpiginous ulcer, the atypical serpiginous ulcer, the marginal ulcer of the cornea and the ulcer rodens. The author deals with the cause, symptoms, diagnosis and treatment of these diseases. La Mothe gives the history of the rodent ulcer from a clinical and bacteriological standpoint and believes there is a possibility of establishing in the near future a classification of corneal ulcers, based upon the diverse microbian

agents. Recent bacteriological investigations go to show that there exists microbes inimical to the eye. From this there has resulted a new specific therapy appropriate to each individual species recognized by bacteriologists. As yet, specific serum therapy is in its infancy. Subconjunctival injections have been employed in the treatment of infectious ulcers of the cornea with or without hypopyon, but with varying success. G. I. H.

Dystropia Epithelialis Cornea.—Reese, Robert G., New York (*Oph. Record,* March, 1913). There are three forms: (1) Due to deposits of mucin and occurring in myxoedematous subjects. (2) Due to thyroidectomy, and (3) the greyish green discoloration of the cornea occurring in disseminate sclerosis. The majority of cases of dystrophy may be regarded as an expression of local disturbances of nutrition. Reese reports one case which he treated with dionin, holocain and massage locally, and the glycerophosphates internally, and there was no appreciable improvement.

Dystropia Epithelialis Cornea is a disease of advanced age, the youngest on record being 43 years old, and it affects chiefly the female sex. It is usually bilateral and when unilateral always affects the right eye. The onset is insidious, visual disturbances existing for years before the condition is brought under observation. The symptoms are marked by absence of any manifestations of irritation—a slight degree of pericorneal injection having been observed in only two of the seventeen reported cases—by insensibility of both cornea, even when the lesion is unilateral, and by variations in visions. The patient usually complains of the vision being worse in the morning in contrast to the vision in glaucoma, and the variations in visual acuity are not attended by variations in pressure. G. I. H.

A Necrotic Case of Keratitis Punctata Superficialis.—Phillips, Wm. L., Buffalo, N. Y. (*Ann. Ophth.,* January, 1913). The author presents this case of keratitis as differing from any other case reported. The symptoms begun in right eye with pain and feeling of sand in the eye. The eye, however, was free from signs of inflammation. Examination by the use of ophthalmoscope and oblique illumination revealed ten to fifteen bluish gray spots, surrounded by a light gray halo, situated in the lower right quadrant of the cornea. These spots were not dull, but were glistening like the rest of the cornea; and at the apex of each spot there was a dark gray infiltration. Collectively the spots resembled a pyramid

situated between two radii drawn from the center of the cornea temporally and directly downward. A few months after the right eye was affected the left eye became similarly involved in its corresponding quadrant. The spots were larger at the perphery and grew smaller as they approached the corneal center. This was due to the size of the halo rather than the actual infiltration, and it was assumed that the drying effect of the air explained the absence of the halo about the central spots. If the lids were held apart for a little bit the halo disappeared from all the spots, showing that the halo was caused by the moisture. No treatment was of service and no cause was assignable, but it was noticed that the disease increased in proportion to loss of sleep and nervous strain. Mental suggestion seemed to be of more value than anything else. The disease has continued for three years, but is now practically cured.

M. B.

Report of Case of Conical Cornea Successfully Treated by the Actual Cautery.—Posey, Wm. Campbell, Philadelphia (*Arch. Ophth.*, March, 1913, XLII, 141), reports a case of conical cornea in which vision was greatly improved by the use of the actual cautery. The apex of the cone, in each eye, was situated a little below and to the temporal side of the pupillary center.

Vision, with correction, was 5/12 in the right eye and 3/100 in the left. Operation was done on the left eye, cauterizing the temporal base of the cone, the apex being but slightly touched with the cautery. A compress bandage was applied after operation. Seven months later the patient could read newspaper type, and, with correcting lens, vision in left eye equaled 5/7½. Vision in the unoperated eye had failed markedly, being less than 5/100. Operation was done on the right eye, with equally good results.

W. R. M.

On a Case of Pseudo-Keratoconus.—Dalmer, Max (*From the eye clinic of Prof. A. Vossius in the University of Giessen. Zeit. f. Aug.*, 29, January, 1913, p. 37). Keratoconus consists in a conical ectasia of the center of the cornea, in which all layers of the cornea participate. Contrary to the human keratoconus, the experimental keratoconus in rabbits is associated with a thickening of the cornea. It is produced by an injury of Descemet's membrane and subsequent swelling of the corneal stroma, without ectasia of the posterior corneal strata.

D.'s case of pseudo-keratoconus presented this condition: A

miner, aged 21, sustained a contusion of his left eye by a piece of iron one 3½ years ago. On admission V. L. counting of fingers at ½ meter. The left eye showed moderate conjunctival and ciliary injection with lacrimation, a slight opacity of 1 mm. diameter, immediately below the center of the cornea, from which projected a transparent cone, that on oblique illumination gave the aspect of keratoconus. Prof. Vossius diagnosed a rupture of Descemet's membrane with conical swelling of the cornea. This was confirmed by the further course. The projection disappeared under eserin and compressive bandage, while the opacity slightly increased. After a month's treatment the binocular loupe of Czapski disclosed behind the opacity of the parenchyma a linear white scar at the posterior surface of the cornea, which must be considered as the sequel of a rupture. C. Z.

On a Case of Necrotic Hemorrhagic Ulcer With Circular Extension From the Sclera to the Cornea.—Murakami, S. (*From the eye clinic of Prof. J. Komoto in the University of Tokio, Japan. Klin. Mon. f. Aug.*, 51, I, February 1, 1913, p. 215). A woman, aged 25, became after extraction of a tooth, affected with gingivitis, swelling of the root of the nose with obstruction and epitaxis. Anti-syphilitic treatment was of no avail, nor arsenic, given on account of possible sarcoma. Swelling of both parotid glands, offensive discharge from the nose and inflammatory swelling of the soft and hard palate with perforation set in. She was delivered of a child, without complication, but the other affections became worse. An abscess of the left parotid was incised and streptococci found in the pus. Six months previously she had scleritis of left eye, which subsided spontaneously. But after swelling of the left cheek an orbital inflammation and a septic circular ulcer developed in the subconjunctival tissue, which rapidly spread and led to gangrene of the superficial layers of the cornea, necessitating enucleation. The anatomical changes are reported in detail. Most probably the affection was caused, in consequence of the abundant anastomoses of the veins of the face, by metastases with streptococci, which originated from the primary focus at the tooth and produced wherever they were conveyed gangrenous inflammations. The ulcer of the eye undoubtedly developed from such a metastatic focus in the episcleral tissue. C. Z.

GENERAL DISEASES AND THE EYE.

Syphilitic Pseudohypopyon.—Rollet, Lyon, France (*Ann. Ophth.*, January, 1913). The accumulation of secretion in the anterior chamber from iritic gumma and corneal infiltration resembles the hypopyon of corneal ulcer, except the hypopyon is of a more golden color and more firmly organized. It may be an accompaniment of the early secondaries or any subsequent stage of the disease. Its early recognition as a syphilitic condition is important, since it responds well to treatment, but if anti-syphilitic treatment is delayed the eye is lost. M. B.

A Case of the Juvenile Form of Family Amaurotic Idiocy.—Gifford, H., Omaha, Neb. (*Ophth. Record*, November, 1912). The author gives the history of the case. Gifford also enumerates five atypical cases that have come under his observation. Other cases in literature are also given. Stock found the main characteristic to be an almost complete destruction of the rods and cones: with the optic nerves very slightly, if at all, atrophied. The ganglion cells were largely preserved, but on examining them carefully it could be seen that the cell body was swollen, with the nucleus pressed toward one wall and with vacuoles present in the cell substance. The nerve layer of the retina was almost normal. The chorioid was only slightly altered. The pigment epithelium showed some displacement into the retina, but was normal over large areas. The ophthalmic picture shows little uniformity, including cases with simple optic atrophy, slight displacement, or atrophy of the retinal pigment, central or peripheral; and marked displacement of the retinal pigment, more or less of the bone corpuscle type. G. I. H.

The Ocular Signs of Diabetes.—Krebs, Adolph, Pittsburg, Pa. (*Pittsburg Medical Journal*, April, 1913), says that almost any of the various parts of the eyeball and its appendages may be affected, and mentions various lesions. He discusses particularly the changes in the crystalline lens and says the onset of myopis in persons above the age of fifty should excite suspicion of diabetes, and the discovery of lenticular opacities should always lead to a thorough physical examination of the patient and numerous careful urine analyses. While unilateral cataract is rare, two coming under the writer's notice are reported. Another case of glycosuria is cited where the eyes changed quickly from a condition of myopia

to one of hyperopia, a very rare occurrence, then back to myopia with no change in the astigmatism. M. D. S.

On Diseases of the Ocular Nerves in Diabetes Mellitus.—Hoffmann, Michael (*From the eye clinic of Prof. C. von Hess in the University of München. Arch. f. Aug.*, 73, p. 261), reports his anatomical examinations (with illustrations) of the various nerves of the eye in two cases of diabetes and found changes which so far have not been described in diabetic or any other affections of the nerves. For control he also examined the nerves of eyeballs which had been enucleated on account of different diseases. In these as well as especially in the diabetic (without noticeable local causes) globes he found accumulation of glycogen in the nerves of the eye, with subsequent destructive changes of the nerves, especially the medullary sheath. He concludes that further investigations must show whether similar histological alterations of the nerves of the eye in two cases of diabetes and found changes which betes, or in certain stages of it (lipemia, coma), and whether analogous conditions are found in local lesions of the nerves of other organs and in other general diseases. C. Z.

On Epibulbar Tuberculosis.—Guzmann, Ernst (*From the eye clinic of Prof. E. Fuchs in the University of Wien. Zeit. f. Aug.*, 29, January, 1913, p. 34). Tuberculosis of the conjunctiva occurs most frequently on the lids, and only exceptionally originates in the bulbar conjunctiva. So far not quite 20 cases have been described. In G.'s case, a woman, aged 42, a pale reddish nodule of the size of a pea with superficial ulceration and very slight circumscribed ciliary injection was situated near the limbus on the temporal portion of the sclera in the horizontal meridian. Otherwise the eyes were normal. Eighteen days after admission the patient died. The autopsy revealed acute miliary tuberculosis of the lungs, kidneys, liver, spleen, leptomeningitis, pericarditis and pleurisy, with old calcified nodules in the lungs. The ocular focus occupied the whole thicknes of the sclera, with ulceration of the superficial layers and the conjunctiva. It contained leucocytes, epitheloid cells, two giant cells and tubercle bacilli. Its origin was undoubtedly endogenous, as the patient did not expectorate, nor had other tuberculous products which could have been ectogeneously transmitted to the eye. The probability of endogenous infection becomes greater the nearer the infiltration is to the limbus and the marginal loops. C. Z.

Zonular Cataract and Tetany.—Hesse, Robert, and Phelps, Edward (*From the eye clinic of Prof. Salzmann and the clinic of nervous diseases of Prof. Hartmann in the University of Graz. Zeit. f. Aug.,* 29, March-April, 1913, p. 238). From the year 1909 on all cases of zonular cataract that came to the eye clinic at Graz, and patients who had formerly been operated on for zonular cataract and returned for other reasons, were subjected to a very careful neurological examination. The diagnosis of certain latent tetany was made if any of the cardinal symptoms, at least Erb's symptom (increase of electrical excitability) was present. Out of 43 cases of zonular cataract, arranged in tabular form, 35, i. e. 81%, had undoubted symptoms of tetany, 4 were almost positive, which would be 90%. Six out of these showed affections of the bones, but of these only 2 severe rachitis, with very slight changes in the lens and no changes of the teeth. Twenty-two out of the remaining 29 cases of tetany exhibited affections of the teeth. Out of the 8 cases of zonular cataract without distinct tetany only 1 was rachitic, 5 had anomalies of the teeth, 3 not.

The authors do not think that zonular cataract is the only affection of the lens in tetany, since they observed within the last three years 34 cataract patients of youthful age, in whom tetany existed or had previously existed. They mostly had total cataract or various forms of partial opacities of the lens.

The authors conclude that it must be assumed with great probability that tetany is the etiological element of zonular and many other forms of cataract at a presenile age. They emphasize that they do not identify tetany with tetanic convulsions and do not attribute the cause of the affection of the lens to these. The tetanoid convulsions are only a partial phenomenon of tetany. It also presents a series of motor, sensitive, and vasoneurotic disturbances, changes of metabolism and the blood, from which the characteristic trophic anomalies, especialy of the ectodermal structures, as skin, nails, hair, teeth, lens, develop. The pathogenesis of the whole multiform clinical picture, fluctuating in its symptomatology, must be ascribed to insufficiency of the epithelial corpuscles, which leads to peculiar pathological alterations in the co-ordination of the functions of the glands with interior secretion. The literature is exhaustively discussed. C. Z.

GLAUCOMA.

Glaucoma.—Good, James W., Winnipeg, Canada (*Ophth. Record,* January, 1913). The author contends that after all theories

are discussed and all opinions considered, we do not understand glaucoma. The most important findings are the fields of vision and the tonometer readings. G. I. H.

Another Glaucoma Operation.—Smith, David Priestley, Birmingham, Eng. (*Ophth. Review,* March, 1913). The writer describes a combination of several well-known procedures, the objects being iridectomy and fistulization of the anterior chamber, consisting of a conjunctivo-corneal flap and a keratome incision notched on its anterior lip; he has performed the operation eight times and recommends it for cases in which scleral puncture is desirable, namely, cases of high tension and shallow chamber.

After cocainizing (or general anaesthesia in acute cases) the conjunctiva is picked up 6 or 7 mm. from the cornea and incised with scissors along a curved line running almost concentric with the corneal margin, so as to leave some conjunctiva uncut between the ends of the incision and the cornea. The flap is dissected up with scissors until, in the middle, the corneal margin is reached. The cornea is split until the area exposed forms an ellipse about 2 mm. wide in the middle.

The vitreous is then tapped with a Graefe knife 6 mm. behind the cornea just above the upper margin of the external rectus. Then the conjunctivo-corneal flap is again picked up and the point of a broad keratome entered immediately (less than 1 mm.) outside the margin of the cornea, the flap laid back on to the keratome, and the latter pushed into the anterior chamber until the incision is about 5 mm. long.

Next a small triangular piece is snipped out of the corneal lip of the incision by two scissor cuts converging to meet just short of the line of reflection. Iridectomy is performed in the usual way, the sphincter being left if possible. Finally the flap is replaced; no suture is needed if the flap is above the cornea—if below it is necessary. C. H. M.

Pathology of Glaucoma.—Nagle, Frank O., Philadelphia (*Jour. Ophth. Otol.* and *Laryng.*, February, 1913.) This article is a comprehensive review of the literature on this subject, but does not lend itself well for review. M. B.

Some Observations in Glaucoma with Schiotz's Tonometer. —Bissell, Elmer J., Rochester, N. Y. (*Jour. Opth. Otol. and Laryng.* February, 1913.) This instrument is considered essential

to the accurate estimation of ocular tension. In its use a local anetsthetic should be used in the eye. The patient on his back and loking directly upward. The lids are separated and the foot-piece of the instrument placed accurately in the corneal center. The assistant should observe the registration of the instrument when directed by the operator, whose attention should be occupied alone with the accurate placing of the instrument. The author considers this very important, because he has found that unless the foot-piece is placed in the center of the cornea faulty registration is the result. He estimated the ocular tension in a boy of 16 with total ophthalmoplegia and in a man of 62 with external ophthalmoplegia, it was 25 mm. hg. in the former and 15 mm. hg. in the latter, the registrations being the upper and lower limits of normal tension. He therefore concludes that the ocular muscles have little action upon intraocular tension. He has applied the negative pole of a galvanic battery to the eye and passed three to five milliamperes for eight to ten minutes and found a drop in tension of from 5 to 30 mm. hg.

He has used the tonometer to check up the action of eserine, heat and subconjunctival injections, and has found that galvanism and eserine yielded the most uniform results. In three cases of simple glaucoma 5% sodium citrate has a tendency to raise the tension. He confirms the findings of Grönholm that on bright days and after moderate use of eyes at near point tension is reduced as much as 5 mm. hg. M. B.

Glaucoma.—Its Cause and Cure Demonstrated in the Laboratory.—Stewart, Thos. M., Cincinnati, O. (*Jour. Ophth. Otol. and Laryng,* February, 1913.) The author calls attention to the work of Martin H. Fischer, Professor of Physiology in the University of Cincinnati, on "Edema." Pathologically speaking, glaucoma is a local edema. Fischer demonstrates that the most intense grades of glaucoma can be induced experimentally in the eye in the absence of any circulation. The eye of an animal dropped into an acid solution will take up water in decreasing amounts as the acidity of the water is reduced to pure water, and that when the water is male alkaline the eye gives up water. The best alkaline solution to use is citrate of sodium. Its use subconjunctivally should be in solutions of 4.05 to 5.41%, using from five to fifteen drops. M. B.

The Management of Acute Haemorrhagic Glaucoma With Advanced Arteriosclerosis.—Ritchie, F. G., New York (*Jour. Ophth. Otol and Laryng.,* March, 1913.) The cause lies in advanced

angiosclerosis with high blood pressure and renal degeneration. The hygienic management is of great importance, consisting in mental relaxation, moderate physical exercise in the open air, moderate clothing and sleeping in fresh air. Constipation must be avoided. Frequent examination of urine necessary to judge of progress. Baths of about 100° F. are advocated. Under dietetics, he has much to say about caloric food values, which is both interesting and instructive. He thinks the protein elements of food should be reduced to the lowest point consistent with the maintenance of bodily strength and the standard of weight. This should require 14 calories to each pound of body weight daily, of which amount 1/40 is to be supplied by the protein elements and the balance by the carbohydrates and fats. The Government Printing Office, Washington, D. C., will supply the Farmers Bulletin, No. 142 and No. 28, which will supply all the data on the heat value of foods.

The amount of fluid taken should be small, just enough to allay thirst. Large quantities increase the duty of the heart and raise the blood pressure by augmenting the volume of blood.

He gives electrotherapy a good deal of credit as a valuable therapeutic measure. He uses the d'Arsonval current by way of the static machine administered by autocondensation. Potential alteration is about the same and just as effectual as d'Arsonvalization. Electric light sweats are also recommended.

Under medical treatment a long list of remedies are given which are to be administered according to the homeopathic indications.

The treatment of the ocular condition consists in the application of the negative galvanic current and the high frequency current, hot applications, mycotics, dionin, and surgically opticociliary neurectomy, avocateiridectomy, parocentices, posterior sclerotomy and finally concludes with advocating the trephining operation of Elliott as the most satisfactory of all. M. B.

The Surgical Treatment of Glaucoma with Special Reference to the Substitutes for Iridectomy.—Pinkham, I. O., Toledo, O. (*Jour. Ophth. Otol. and Laryng.*, March, 1913). The prominent substitutes are scleral trephining, sclerectomy and sclerecto-iridectomy and cyclodialysis. The easiest to perform is the scleral trephining operation of Elliott, and in his opinion is highly efficient. He is also very partial to cyclodialysis. He considers the failures are largely due to faulty technic, but it would appear as though the technic is difficult, although he claims it is an easy operation to perform and leaves no ocular deformity. M. B.

INJURIES.

Hole at the Macula.—Clapp, C. A., M. D., Baltimore, Maryland (*Ophth. Record,* February, 1913.) The author cites a case with the history of a blow over the right eye. G. I. H.

A Case of Macular Hole Due to Traumatism.—Blake, Eugene M., New Haven, Conn. (*Ophth. Record,* December, 1912.) Patient had been struck upon the left eye with a ball. Macular holes are produced by an edema of the retina at the posterior pole. G. I. H.

Report of a Case of Steel Passing Through Eye Ball into the Orbit.—Krider, Edward E., Oelwein, Iowa (*Ophth. Record,* December, 1912.) The piece of steel (5 mm. long and 2 mm. wide) had passed through the posterior wall of the globe, into the orbit and was lodged about 6 mm. from and to the nasal side of the nerve head. Enucleation was performed. Three X-ray pictures were taken of the injured eye—the first and third pictures were taken with the eye perfectly stationary and the second with the eye in constant rotation. The first and third pictures showed the steel to be apparently embedded in the posterior wall of the globe, while in the second picture no foreign body was visible. G. I. H.

The Giant Magnet in the Extraction of Bodies from the Eye.—Nance, Willis O., Chicago, Ill. (*Jour. Ophth. and Oto-Laryn.,* October, 1912.) The author renews the history of the giant magnet since its introduction in 1892 by Prof. Haab. The author also traces the introduction of the hand magnet, 50 years ago, to the credit of Dixon of London, but the principal objection to its use is that in order to accomplish any good result in removing magnetic substances from the eye it is necessary to insert the tip for some distance into the original wound or into a new wound, thereby adding additional violence to an already injured structure and the possibility of conveying infection therein.

Nance gives the technic for the removal of foreign bodies from the vitreous. The author favors the anterior route whenever practical to avoid any retinal detachment. G. I. H.

Burns of the Eyeball from the Contents of So-Called "Water-Core" Golf Balls.—Wood, Casey A., Chicago, Ill. (*Ophth. Record,* October, 1912.) Both the ocular and palpebral

conjunctivas were swollen and hyperemic: in two situations there were subjunctival hemorrhages. There was a marked ciliary and scleral congestion. About two-thirds of the cornea was covered by a thin whitish eschar. The vision was restored to 6/12 minus. Wood warns against the use of water-core balls. G. I. H.

A Case of Severe Burn of the Eye from the Contents of a Fluid Core Golf Ball.—Nance, Willis O., Chicago, Ill. (*Jour. Ophth. and Oto-Laryn.*, November, 1912.) Patient suffered intense pain in the eye and the skin surrounding the eye was burned in one direction for a distance of two inches. Examination demonstrated a deep opacity of the cornea in almost its entire area. In addition there was a cicatrized conjunctival area extending from the limbus for a distance of almost an inch to the inferior nasal aspect, at least one-quarter of an inch wide. The remaining bulbar conjunctiva was swollen and red. Vision was reduced to mere perception of light. Tension was minus. Enucleation of the eye was advised. G. I. H.

A Case of Injury in Which Six Pieces of Steel Were Discovered in an Enucleated Eye; Only One Piece Being Found by the X-Ray.—Allport, Frank, Chicago (*Ophth. Record*, January, 1913). An X-ray picture showed one large piece of steel. Allport asks: "Did the six pieces fly into the eye at one time through the opening, or did one piece enter the eye and break up into six pieces?" G. I. H.

Atrophy of the Optic Nerve Following Injection of Olive Oil and Lanoline for the Removal of Wrinkles.—Fisher, W. A., Chicago, Ill. (*Ophth. Record*, January, 1913). The left eye presents a picture of optic atrophy. The pupil of the left eye does not contract when the light is thrown into it, but does contract when light is thrown into the right eye. The nerve head is white, the edges are sharply cut and well defined, and the arteries are contracted. The right fundus is perfectly normal. G. I. H.

Single Rupture of the Choroid Involving Half the Circumference of the Eyeball.—Todd, Frank, Minneapolis, Minn. (*Ophth. Record*, May, 1912). History of severe blow in the left eye from a man's fist. This rupture is a little wider than the largest vein of the retina and is located exactly in the horizontal meridian of the eyeball for the whole distance. G. I. H.

Traumatic Injuries to the Cornea.—T. W. McManus, Waterloo, Iowa (*Jour. of Iowa State Med. Society,* March 15, 1913). After discussing different types of injuries and special types of therapy, the writer concludes as follows: "1, all injuries of the cornea are infected wounds; 2, argyrol is the most practical and efficient antiseptic for the conjunctival sac; 3, if bacteriological examination shows pneumococci in the conjunctival sac, the wound should be cauterized immediately with the thermo-cautery, but in other cases phenoliodine is as effective in controlling infection and less destructive to normal tissue; 4, opening the anterior chamber should be done most conservatively; 5, promptly sacrifice a worthless eye for the protection of a good eye; 6, use atropine freely to secure rest and equalize circulation; 7, an injury of the cornea not healed within three days is a serious case, and the patient should be confined to bed under professional supervision."

M. D. S.

Removal of Steel From the Eye.—McCollom, J. W., Portland, Oregon (*Medical Sentinel,* April, 1913). The author describes the removal of ordinary steel particles from the surface of the cornea and also from the interior of the eye. He warns against giving the verdict of no steel in the eye because it is not attracted by the magnet, as there is a form of manganese steel which is now being used on account of its hardness which is non-magnetic or nearly so, rendering the magnet practically useless. When the magnet fails an X-ray picture is made. Failure to remove the steel usually means enucleation sooner or later and which should not be deferred too long.

M. D. S.

To the Question of Treatment of Pieces of Iron in the Lens.—Ammann, E., Winterthur (*Klin. Mon. f. Aug.,* 51, I, February, 1913, p. 210). The right eye of a man was injured by a piece of steel while grinding this on the emery wheel. Five days later he came to A., who found a small wound in the lower temporal quadrant of the cornea, behind it an opacity of the anterior capsule, 1.5 mm. in diameter, and towards the temporal side near the posterior capsule a piece of iron, which after extraction weighed less than 1 mgr. The wound canal appeared as an opaque band, the remaining portions of the lens were absolutely clear. V 0.25, with +0.5=+cyl. 1.50=0.6, due to astigmatism of the lens, since the ophthalmometer showed no astigmatism of the cornea. V remained the same for two months, but four weeks later it was di-

minished by an extensive opacity around the foreign body and star-shaped posterior cortical cataract. A. opened the anterior capsule to an extent of from 1 to 2 mm. simultaneously with the corneal section and extracted the piece with Haab's magnet. V=0.15. The opacity cleared up, but the posterior cataract progressed, so that seven months after the operation V was only 1/36. A. attributes the opacity not to the mechanical lesion by the lens, since this remained clear for eight weeks, but to the subsequent chemical action of steel by the conveyance of soluble iron salts to the posterior pole. As these could not be removed by extraction they continued to exert their deleterious influence for some time afterward.

C. Z.

Changes and Injuries of the Eye by Light.—Schanz, F., Dresden (*Deut. Med. Woch.*, February 20, 1913, No. 8, p. 365), gives a very good synopsis of the action of the different kinds of rays of light, which excite the sensitive elements of the retina directly, indirectly, or not at all. All three reach the anterior segment of the eye and act on the parts which are not permeable by light, the more intense, the more shortwaved they are. The transparent parts of the eye are influenced only by the rays which are absorbed by these parts. These are chiefly the shortwaved rays, which by being absorbed by the cornea irritate the sensitive nerves and in the conjunctiva cause the distressing symptoms of pressure, burning, lacrimation and, by longer action, catarrh of the conjunctiva, electric ophthalmia, etc.

A large portion of the shortwaved rays after passing through the cornea into the lens are partly absorbed by this, partly converted into rays of greater wave length, causing the fluorescence of the lens. Their augmentation does not seem irrelevant for the lens. The cataract of lass blowers and the occurrence of senile cataract in tropical India at a much earlier age may be attributed to these rays.

The fluorescent light irritates the retina by glaring. A part of it, the lavendel gray, is the fluorescent light of the retina. Another part is not transformed and, on more intense action, produces microscopic changes of the retina. Functionally they seem to diminish the dark adaptation of the eye. By continued action they may produce chronic electric ophthalmia and disturbances of the color sense.

For protecting the eye euphos glass seems best adapted, as it absorbs very well the indirectly acting rays and very little the

visible rays. By absorbing the rays which produce fluorescence in the eye vision is increased by this glass, as found empirically by hunters. Gray euphos glass and Fieuzal glass absorb the indirect rays and weaken the visible rays like the smoked spectacles. C. Z.

To the Knowledge of "Angiopathia Retinae Traumatica."—Purtscher, O., Klagenfurt (*Centralbl. f. Prakt. Aug.*, 37, January, 1913, p. 1), described in a former communication in von Graefe's Archiv. 82, II, p. 342, two cases with changes of the fundus which he considered as typical consequences of severe traumatisms of the head. They consist in bright white patches in the inner layers of the retina, of varying size and number, generally grouped around the disc and the macula, mostly in the course of the large retinal veins. The discs were perfectly normal, but there were more or less numerous venous hemorrhages in the retina in form of stripes or spots. In one case the affection was bilateral, in the second case unilateral, but the other eye was completely amaurotic from atrophy of the optic nerve in consequence of fracture of the optic canal. The impairment of vision in the three eyes was only moderate. The white patches and hemorrhages disappeared entirely in the second case, which was under long observation. Similar cases have been described by Gonin and Liebrecht, which are quoted. The etiological element in all cases seemed to be a momentaneous increase of intracranial pressure and an entrance of cerebrospinal liquor into the retina. P. attributes the white patches to a direct extravasation of lymph from the perivascular lymphatic spaces into the retinal tissue. C. Z.

The Lesions of the Eye by Inspersion of Calomel Into the Conjunctival Sac and Simultaneous Internal Use of the Haloid Salts (Iodid of Potassium, Bromid of Potassium, and Chlorid of Sodium).—Scholms, Burghard (*From the eye clinic and pharmacological institute in the University of Greifswald. Arch. f. Aug.*, 73, p. 220), reports 37 experiments on rabbits, by which he investigated these questions, and from which he reached the following conclusions: 1. Calomel dusted into the conjunctival sac causes slight redness and swelling, which disappear within 24 hours. 2. In simultaneous internal medication of iodid of potassium severe inflammatory symptoms develop, leading to intense redness, swelling and edema of the conjunctiva, with complete opacity and cauterization of the cornea. 3. These phenomena increase with the quantities of the drugs. 4. Inspersion of calomel

into the eye and injection of larger doses of bromid of potassium, are followed by intense conjunctivitis, chemosis and erosions, occasionally opacities of the cornea. They disappear relatively soon, with almost complete restoration to the normal condition. 5. Application of calomel and chlorid of sodium do not cause severe changes. 6. Subbromid and subiodid of mercury produce the same slight changes like calomel. 7. Bromid and iodid of mercury are extremely irritating and caustic. 8. It can be shown in the test tube that the iodid, respectively the bromid, develops from calomel and a solution of iodid of potash, respectively bromid of potash. In the first case a complex mercurial iodid salt is generated which contanis mercury in non-ional form, but its mercury can be easily converted into the ional form. 9. Hence cauterization of the eye in applications of calomel-iodid of potash, respectively bromid of potash, is due to the formation of iodid and bromid of mercury, not subiodid and subbromid of mercury. 10. The practical conclusion is that the inspersion of calomel and the simultaneous internal use of iodid of potassium, even in a single dosis, must be avoided. It must also be warned against inspersions of calomel after longer applications of bromid of potash. Inspersion of calomel and taking very salty food does not seem to be harmful to the visual organ. C. Z.

A Case of Orbital Thrombophlebitis After Extirpation of the Lacrimal Sac. With Anatomo-Pathological Findings.—Takashima, S., Saga, Japan (*From the eye clinic of Prof. L. Heine in the University of Kiel. Klin. Mon. f. Aug.*, 51, 1, March, 1913, p. 338). A woman, aged 72, was long under treatment for conjunctivitis. As this was unsuccessful and a marginal opacity of one cornea developed, both lacrimal sacs were extirpated. The next day an abscess of the right lid formed with gangrene, followed by multiple abscesses at the scalp and temple. In spite of large incisions pleurisy set in, and the patient died four days after the operation.

The anatomical changes of the orbit and the eyeball are given in detail. They showed that from the inflamed tearsac the streptococci and staphylococci were by the surgical interference transported into the surrounding tissue and by the plexiform capillaries at the periphery of the lacrimal sac, the frontal and superior ophthalmic veins into the scalp, the orbital tissue and the eyeball, finally through the cavernous sinus to the meninges, producing the fatal pyemic symptoms.

T. found in literature only ten cases of phlegmon of the orbit complicating affections of the lacrimal passages, but none elicited by extirpation of the tear sac. In view of the fatal ending of his case he says that it may be well to refrain from extirpation of the tear sac in such complicated cases and to resort merely to incision.

C. Z.

INSTRUMENTS AND METHODS OF EXAMINATION.

U-Shaped Hemostatic Lid Clamp.—Stevenson, Mark D., Akron, Ohio (*Ophth. Record,* February, 1913). Rubber tubing pulled over the metal arms, the tissues are not cut, and very little, sometimes no pain is caused. Set screws are made so that the pressure of the blades can be regulated from either side. G. I. H.

A Capsule Forceps.—Gradle, Harry S., Chicago (*Ophth. Record,* February, 1913). An S-shaped bend in the shank of the forceps just above the tooth area, so that the forceps can easily slide over the iris and engage the anterior capsule while the iris proper is well below the shank, and in no danger of being entangled.

G. I. H.

A Modification of the Prince Advancement Forceps.—Allport, Frank, Chicago, Ill. (*Ophth. Record,* November, 1912). The end of one blade has fine teeth like a comb, placed at its edge, the other end of the blade has an elongated opening for the reception of the teeth. G. I. H.

A Practical Electric Perimeter.—Black, Nelson M., Milwaukee, Wis. (*Ophth. Record,* March, 1913). The author states that by taking the field in a dark room there will be but little variation in the width of the pupil. As there will be no attempt at accommodation the position of the plane of the iris will remain stationary. The retina will be in a state of greatest sensitiveness to light stimulation because of its dark adaptation and by taking a field in the dark there is nothing to distract the patient's attention. The perimeter is designed after the latest model of the McHardy instrument. The instrument is made by the DeZeng Standard Co., but the electric attachment to this perimeter can be applied to any McHardy instrument. G. I. H.

An Accessory to the Ophthalmometer, Forming a Corneal Microscope.—Gradle, H. S., Chicago (*Ann. Ophth.,* January,

1913). An ophthalmometer consists of an ocular, and objective and an intervening birefringent prism. By removing the prisms we have left a tube containing an ocular and an objective—in other words, a microscope. To accomplish this the truncated corneal tube of a Hardy Ophthalmometer was removed from the anterior part of the ophthalmometer and there was substituted another similar tube, but containing only the objective lens. This gives a microscope with a magnifying power of from six to eight diameters. The illumination is accomplished by the addition of an arc to the anterior end of the microscope tube. This arc bears a simple eight candle power electric globe. The rays are condensed upon the eye by a focusing lens in the end of the light tube. M. B.

A Pupillary Disc for the Correction of Spheric Aberration.—Mason, Albert B., Atlanta, Ga. (*Ophth. Record,* December, 1912). The author has devised the pupillary disc, which Meyrowitz of New York has made. The disc is used in the trial frame, being of the same size as the ordinary trial lens. It is 35 mm. in diameter and 2 mm. thick. The opening in the center is 8 mm., corresponding to the average size of the dilated pupil. The slide has openings 2, 3, 4, 5 and 6 mm. in diameter, so arranged that any one of them can be centered over the opening on the slide. The method of using the disc is as follows: The size of the pupils with accommodation at rest is noted at the preliminary examination. With the pupils dilated and the patient seated at the trial case, the disc is inserted in the trial frame, with that opening on the side that corresponds to the size of the pupil noted at the preliminary examination accurately centered in front of the eye. The trial case examination is then made in the usual way. The author concludes with the statements: 1. Spheric aberration should be corrected. 2. Short eyes—far-sighted—have positive spheric aberration, which, in nearly every case, if left uncorrected, changes the refractive error. 3. Long eyes—near-sighted—have negative spheric aberration, which, if left uncorrected, does not change the refractive error, though the vision is not as acute. 4. The pupil in health approximates 4 mm. in diameter. G. I. H.

Tonometry; With Description of a Tonometer.—Gradle, Harry S., Chicago, Ill. (*Ophth. Record,* September, 1912). The foot plate is 3 millimeters smaller than on the Schiotz instrument, allowing one to see the pupil while using the tonometer and to gauge accurately its position upon the cornea. The radius of curva-

ture of the foot plate is 7.6 millimeters, corresponding more nearly to the radius of curvature of the anterior surface of the cornea as measured by Koster and Tscherning, whereas that of the Schiotz measures 8.4 millimeters. The stylet has a diameter of only 2 millimeters as compared with the 3 millimeter diameter of the Schiotz, thereby bringing the weight more nearly to a mathematical point. The stylet is fixed in the instrument and is not movable. The weights all have the same value, namely, one gram each, and are merely dropped over the stylet, which passes through a hole in the middle of the weight. The stylet and the pointer have a fixed mechanical relationship and but little free play. Hence each instrument, when once set at the zero mark, cannot be altered, and there is therefore no necessity to bend the pointer. The instrument weighs less than the Schiotz and is easier of manipulation. The author concludes with the statement that only by the use of the tonometer are we able to judge accurately the progress of a case of glaucoma. G. I. H.

On the Determination and Localization of Heavy Foreign Bodies in the Eye by Means of Roentgen Rays.—Haudek, Martin (*From the central Roentgen laboratory of Dr. G. Holzknecht in the General Hospital at Wien. Zeit. f. Aug.*, 29, March-April, 1913, p. 231). Both eye clinics in the University at Wien send their patients with ascertained or supposed injuries of the eye by foreign bodies to Holzknecht's institute, about 100 a year. Out of the 91 cases examined within the first eleven months of this year the findings were negative in 56, positive in 35. H. describes the methods used at the laboratory. Of every patient a lateral double plate (13x18) of the injured eye and its surroundings is made. This shows (1) whether a specifically heavy foreign body is present, (2) whether it lies within the orbit, respectively the eyeball, (3) how large it is. The localization of a foreign body is determined by five pictures in different directions of fixation of the eye. H. also discusses the sources of errors, but says that in general the results of these methods were satisfactory. A few illustrative cases are reported. C. Z.

On Novel Methods of Ophthalmology.—Wolff, Hugo, Berlin (*Zeit. f. Aug.*, 29, March-April, 1913, p. 215), describes his new methods under the following headings: 1. Unocular, and 2, stereoscopic ophthalmoscopy without reflexes in the inverted image. 3. Photography and projection of the stereo-ophthalmoscopic inverted image. 4. A simple demonstration eyepiece for unocular

and stereoscopic ophthalmoscopy without reflexes in the inverted image. 5. A handy collection of instruments to ophthalmoscopy without reflexes in the erect and inverted unocular and stereoscopic images. 6. A new ophthalmoscope for the erect image.

As an abstract would not be sufficient for the understanding of these topic, the reader must be referred to the original. C. Z.

LACRIMAL APPARATUS.

Extirpation of the Lacrimal Sac in Chronic Dacryocystitis.—Cahoun, F. Phinizy, Atlanta (*Charlotte Med. Journ.*, April, 1913). The writer reviews the surrounding anatomy of the lacrimal sac. He does not follow conservative treatment except in a very few selected cases, but from the very beginning extirpates the sac. The indications for removal as he sees them are as follows: "1, the unwillingness or the inability on the part of the patient to submit to a long course of the probe treatment, a timidity on the part of the patient that would likely render the probe treatment unsuccessful; 2, evidence of history of previous attacks of phlegmonous, or acute dacryocystitis; 3, presence of any indication for an operation on the globe, and especially a cataract extraction; 4, an ulcer of the cornea caused from dacryocystitis which resists all forms of treatment; 5, finally, if after a considerable length of time these cases discontinue the probe treatment and a failure results, the sac should be removed." He usually prefers extirpation under a local anesthetic and he believes that in a series of cases 90 per cent is a conservative estimate of those in which a complete cure has resulted. M. D. S.

On Fundus Concrements in the Lacrimal Canaliculus. A Contribution to the Question as to the Streptothrix.—Wissmann, R. (*From the eye clinic of Prof. W. Uhthoff in the University of Breslau. Klin. Mon. f. Aug.*, 51, 1, March, 1913, p. 281), reports a case of thickening of the upper canaliculus of a peasant woman, aged 61, with inflammation of the adjacent parts of the lid and caruncle, and an ulcer of the cornea caused by a piece of coal. After incision of the canaliculus a yellowish granular mass was removed with a spoon. The microscopic examination revealed in this mass an organism which consisted of fine threads with ramifications of pleomorphic qualities. Cultures were made and with these mice and guinea pigs inoculated, which is described in detail. Neither in direct preparations nor in the experiments on animals

globular formations (drusen) and nodules could be found. Biologically it was strictly anaerobic, grew best on glycerin agar and grape sugar-bouillon, and was of slight pathogenicity for animals. W. classified it as streptotrix.

All important cases of fungus concrements from literature are arranged in tabular form, and discussed. W. reached the following conclusions: 1. The strains of streptotrix, cultivated from the lacrimal canaliculi, possess properties, which in the greater majority are common to all strains, by which they can be distinguished from pathogenic streptotrixes found in other places. 2. The cultures of W.'s case strictly belong to this group. 3. In view of the always characteristic clinical picture it does not seem improbable that also the bacteriological conditions are of uniform character. 4. The simple term fungus concrements seems to be the most accurate. 5. Streptotrichia and actinomycosis must be sharply distinguished. Real actinomycosis of the lacrimal canaliculi certainly is very rare and the general term actinomycosis of the canaliculi is not warranted. C. Z.

LENS.

On the Tolerance of the Vitreous to Dislocated Lenses, as an Index to Reclination in Given Cases.—De Obaprio, P., San Francisco, Cal. (*Jour. of Ophth. and Oto-Laryn.*, May, 1913). As a result of his observation the author has established for some time past the practice of reclination in the treatment of tremulous cataracts, as the safest means to obviate the dangers of extraction, as there is nothing to support the immediate flow of large quantities of vitreous when the zonula is defective and the vitreous very fluid. G. I. H.

MATERIA MEDICA AND THERAPEUTICS.

Thyroid with Arsenic, and its Associated Internal Secretions in Diseases of the Eyes.—Muncaster, S. B., Washington, D. C. (*Ophth. Record*, July, 1913). The author has been using a tablet containing thyroid gland substance, 1 grain, adrenals 1/60 rain and sodium cacodylate 1/200 grain in cases of retinitis pigmentosa, and choroiditis where there were old pigment deposits, and has been surprised at the beneficial effect. G. I. H.

Phlyctenular (Eczematous) Conjunctivitis and Keratitis, with Special Reference to Etiology and the Value of Tuberculin as a Diagnostic Agent: Together with the Re-

port of Forty Cases.—Davis, A. Edward, and Valgan, Harry. (*Ophth. Record*, September, 1912). The author concludes with the statement to the effect that whether the phlyctenule itself, which may be considered a "pseudo-tubercle," is due to tubercle bacilli, or to the toxins of this bacillus, or to other cause, is yet to be determined. In the meantime, judging from our own limited use of tuberculin in these cases, it is our opinion that tuberculin should be used in every case, both as a diagnostic and as a therapeutic measure, as a specific, if you please, and the general hygienic and diabetic measures should be carried out, of course, just as in any other disease in which the system is in a run-down condition.

G. I. H.

On the Use of Noviform Salve in External Eye Diseases.—Clausen, W. (*From the eye clinic of Prof. F. Schieck in the University of Koenigsberg. Zeit. f. Aug.*, 29, March-April, 1913, p. 295). Noviform, a combination of oxide of bismuth with tetabrombrenzkatechin, Bi $(C_6Br_4O_2)$ OH is a non-toxic yellowish green powder without taste or smell and insoluble in water, of disinfecting and exsiccating properties. Within the last few months a large number of external eye diseases of the eye clinic at Koenigsberg were treated with noviform vaselin, from 5 to 20%, with very good results. Ladisch reported in his dissertation on 150 out of these cases. The most striking and rapid results were obtained in squamous and ulcerous blepharitis ciliaris, also in superficial lesions of the cornea, e. g. erosions, or after the removal of foreign bodies. Bacteriological examinations showed that 10% noviform salve has about the same inhibitory action on the growth of staphylococcus pyogenes aureus as 1% yellow oxide of mercury ointment. Noviform is manufactured by the chemical works of Heyden A.-G., Radebeul-Dresden.

C. Z.

The Scientific Foundation of Zeozon Therapy.—Pincus, F., Coeln (*Archiv. f. Augenheilkunde*, 73, p. 291). Zeozon, monoxid-derivative of the glycosid esculin, which is found in the bark of the horse chestnut, has been introduced by Unna in form of a paste for the protection of the skin against undesirable effects of the sunlight. Ruhemann used zeozon water, a from 0.3 to 0.5% solution of the orthooxid derivative of Unna's preparation with boracic acid, in 40 cases as eye water against glaring, and reported, that all distressing symptoms disappeared after 4 instillations per day.

At the instance of Prof. C. von Hess, P. investigated the properties of zeozon experimentally. He found by spectrographic-photographic methods that a thick layer of zeozon water absorbs the ultraviolet rays, but not in thin layers. His experiments on rabbits proved without exception that instillations of zeozon water into the eye are not capable of protecting this in any way against the action of ultraviolet rays, a result which with consideration of the physical conditions of absorption of the rays of light by fluids and the physiological processes following the introduction of fluids into the conjunctival sac was to be expected from the start. He therefore urgently warns against relying on the protection by zeozon water against glaring. C. Z.

On the Influence of Salvarsan on the Hearing Organ.—Rimmi, E., Triest (*Deut. Med. Woch.*, January 9, 1913, No. 2, p. 71), reports the clinical histories of 8 syphilitic patients, who a few weeks or months after injections of salvarsan became partially or totally deaf on one or both, previously healthy, ears. He assumes that a slight syphilitic process in the acoustic nerve or its ramifications in the inner ear, which before the injection of salvarsan made no marked symptom and had remained latent, while previously not reacting to mercury, suddenly flashed up. A reactive inflammation occurs in the nerve analogous to that in a lupous focus after injection of tuberculin. Hence the greatest caution is indicated in subjecting luetics who present even the least disturbances of hearing, to salvarsan treatment.

C. Z.

MISCELLANEOUS

Report of Unusual Eye and Ear Cases.—Lewis, Archibald C., Memphis (*Memphis Med. Monthly*, February, 1913), reports a case of a boy of 6 years from whose right eye he removed a polypus springing from the retrotarsal fold. In the fornix above was found the dried bloom of a weed about the size of a large pea. The boy's eye had been giving him trouble for six or eight months but he had suffered no acute pain. Another case reported is that of hyaline degeneration of the cornea in the left eye of a man aged 62. This condition had been treated for several months previous by cauterization with a strong solution of silver nitrate. Suffering was intense but under the use of atropine, dionin, hot application and rest from the light, the pain and inflammation subsided promptly. In four weeks the cornea was clear except for two patches of

interstitial deposits. Another case was one of keratitis neuroparalytica in a negro man aged 71. An unusual feature of this was the identical appearance of the two eyes. Vision was reduced to a little more than light perception and the patient never suffered any pain. M. D. S.

Metastatic Purulent Ophthalmia (Endophthalmitis Septica).—Alter, F. W., Toledo (*Ohio State Med. Jour.*, March 15, 1913). The writer discusses the etiology and pathology of this disease, reports a case, and summarizes as follows: "1. Metastatic ophthalmia of a bilateral character offers a bad prognosis. Probably 90% of the cases die from the underlying sepsis. 2. The unilateral cases give a better general prognosis, although the eye involved is usually lost. 3. The rare cases of preservation of some vision are found in acute exanthemata and especially in epidemic cerebrospinal meningitis. 4. The streptococcus is the most frequent and serious offending microorganism. 5. Under the head of prophylaxis, better and cleaner obstetrics and more rigid asepsis in surgery will help to eliminate metastatic ophthalmia."

M. D. S.

On the Behavior of the Temperature in Diseases of the Eye.—Igersheimer, Jos. (*From the eye clinic of Prof. E. von Hippel in the University of Halle a. S., Zeit. f. Aug.*, 29, January 1913, p. 1), studied within the last few years the behavior of the temperature of several hundred eye patients. The temperature was taken at least 4 times a day, in numerous cases every 2 hours, if possible with due consideration of the normal individual temperature, which greatly varies. The slight rise of temperature on the day of an operation, which is generally due to psychical factors, must also be considered. In phlegmon of the tearsac high fever was observed, but in the non inflammatory dacryocysto-blennorrhoea the temperature was normal. After injuries and operations on the lids a slight rise of temperature was observed on the first and second days. Aseptic operations with opening of the eyeball showed not the least rise of temperature, which however occurred in panophthalmitis. Cases of iritis, chorioiditis and neuritis, especially of tuberculous inflammations of the eye, presented normal temperature, in concordance with the experience, that a tuberculous process in the eye does not affect the whole body. Parinaud's conjunctivitis, which recently is considered as tuberculous, seems to be accompanied by higher temperature. If intraocular inflammations are complicated by fever, it must be attributed to the source

of the ocular affection, e. g., the puerperal uterus in retrobulbar neuritis during the puerperal state. Patients with recent parenchymatous keratitis had almost without exception normal temperature. It may however be accompanied with fever, if complicated by effussions in the kneejoint in consequence of hereditary lues. In a large percentage of purulent corneal ulcers typical subfebrile temperatures were observed for several days, decreasing and subsiding with the healing of the ulcers.

I. controlled these clinical observations by experimental inoculations of the cornea of rabbits with various bacterial cultures, with the following results: Injections of virulent streptococci into the cornea may exert an influence on the whole organism, indicated by a rise of temperature. This rise of temperature, as well as the reactive iritis, is not caused by the microorganisms, but by their products of metabolism, which are diffused through the cornea into the anterior chamber and hence are conveyed to the body. The reactive iritis and the rise of temperature are coordinate processes, apparently dependent on the virulence and quantity of bacteria in the cornea. That the very virulent streptococci did not invade the body followed from the fact, that the animals lived without any signs of disease. Hence it is most probable, that the higher temperature in human corneal ulcer is caused by the products of metabolism of the bacteria which created the ulcer. The observations of general sepsis from experimental corneal infection with pneumococci and sepsis bacilli in mice by Roemer and Loeffler and the experiments of Wessely on anaphylaxis, corroborate the conclusion reached by I. from his clinical and experimental studies, that the eye participates not only secondarily in the most different general diseases, but that vice versa a primary lesion of the eye and, what is very remarkable, of the avascular cornea, may influence the whole organism, in geenral, however, only in infectious by pus producing bacteria. C. Z.

MEDICAL SOCIOLOGY

The Needs of the Eye, Ear, Nose and Throat Surgeon in General Hospitals.—Allport, Frank, Chicago, Ill. (*Ophth. Record,* April, 1913). The author praises such institutions as the New York Eye and Ear Infirmary, the Massachusetts Eye and Ear Infirmary, etc., for their permanent operating room, nurses and internes who serve long terms and who become familiar with their duties. At St. Luke's Hospital Allport has now a long term interne and nurse. G. I. H.

Protection of the Eyes of School Children.—Black, Nelson M., and Vaughn, F. A., Milwaukee, Wis. (*Ophth. Record*, February, 1913). These authors are of the opinion that by proper co-operation between educators, ophthalmologists, illuminating engineers, publishers and others, reading matter in the form of school books, and the illumination of the school rooms by daylight and artificial light can both be improved to such an extent as to materially protect and preserve the eyesight of school children, to the inestimable advantage of the present and the future generations. It is suggested to have the paper a light tinge of amber, or other hue, or perhaps better still, have alternate pages of different tints. It is thought certain that by proper investigation a satisfactory combination of half-tone and print could be secured with a sufficiently matt surfaced paper of comfortable tint to be worthy of general adoption. The indirect method of illimination, if properly engineered, seems to possess very desirable characteristics for the school room, where good visual acuity is imperative, and eye strain or fatigue and depression of visual functions from the effect of glare, or other causes, are to be avoided. G. I. H.

The Optometry Question.—Stricker, Louis, Cincinnati (*Ohio State Med. Jour.*, February 15, 1913). The writer discusses the matter of legislation by which opticians would be licensed in the state of Ohio. He believes the time will come when it will be necessary to establish some state regulation whereby only such physicians will be legally permitted to declare themselves as specialists as have passed a special state board examination and given evidence of their ability. He emphasizes the importance of the medical profession becoming a unit in the opposition to such legislation. He points out the need of a publicity campaign which would show the work done by the medical profession along preventive lines in conserving health and life and incidentally eyesight and preventing blindness. M. D. S.

School Books That Ruin Eyesight.—(*Literary Digest*, February 22, 1912). "The injury done to the eyes of school children by the books that they study has been investigated by a committee of the British Association for the Advancement of Science, whose report has recently appeared in pamphlet form. The conclusion of the committee is that there is a serious amount of visual defect among school children, and that some of it is due to their books. It recommends the establishment of a standard of book production and the prohibition or boycotting of books that are below standard, so

that sight destroying print shall no longer be used." "Among the specific recommendations of the committee are that paper should be unglazed, but hard, smooth, and opaque, and preferably white or cream colored; that elaborate or complex pictures be avoided; that the ink should be black; that the type should be hand set, and never in double columns; and that the type face should be clean cut and well defined, with little contrast between the finer and heavier strokes. The form of the letters, the length of lines, the spacing, etc., all receive careful, detailed, treatment."

M. D. S.

The Sociologic Aspect of Errors of Refraction.—Zentmayer, Wm., Philadelphia (*Ann. Ophth.*, January, 1913). The affections of the eyes that may lead to incurable blindness and consequently to an economic loss and possible tax upon the community may have their origin in, or be aggravated by, errors of refraction. It would aid in the efficiency of labor and prove of economic saving for corporations or others with large office forces to require of applicants for employment an examination of the eyes by a competent ophthalmologist and correction of refractive errors which were of importance. The examination of the eyes of school children by a competent ophthalmologist should be compulsory by state law. It is possible that epilepsy may have in some cases a reflex ocular origin, therefore this question should be made the subject of future careful study. Working men compensation laws are of the utmost importance and should require that before employment the eyes of applicants should be examined by an ophthalmologist and where subnormal visual acuity exists as the result of errors of refraction to have it brought to normal by correction of the error. A campaign of education of the public to the danger of entrusting the examination of the eyes and the treatment of defective vision to those whose only qualification is the assurance, and whose only aim the successful accomplishment of a business transaction, should be inaugurated. That this be done through the columns of such papers as hold the public good above commercialism. M. B.

Optometry and Its Relation to the Public Welfare.—Krebs, Adolph, Pittsburgh, Pa. (*Pittsburgh Med. Jour.*, April, 1913), discusses different phases of this question and gives in full a statement to be sent to the members of the medical profession by the Commission on the Conservation of Vision, of the Medical Society of the State of Pennsylvania, in view of the fact that an effort will be made during the present session of the legislature

to pass a law legalizing "refracting opticians." "That the practice of medicine and surgery, both general and special, should be in the hands of those who have been graduated from reputable medical colleges and have been licensed by the State Medical Examining Board is evident. Therefore, it is eminently proper and urgently important that the efforts of those who have not received a medical education to obtain legal recognition of their treatment of diseases and affections of the human body, in whole or in part, should be opposed. The eye is an integral portion of the body, and is subject not only to diseases peculiar to itself, but frequently participates in, and gives evidence of, affections of the cerebrospinal, cardiovascular, respiratory, renal and digestive systems, as well as those of the genital organs, the liver, accessory organs of nutrition or ductless glands, accessory nasal sinuses, blood, etc. Anyone who is unacquainted with this relationship and its effects evidently is unfitted to examine an eye for the purpose of correcting its defects, no matter whether this correction requires, optical, surgical or medicinal therapeutics. He who is medically untrained is liable to fail to recognize on the one hand, for example, glaucoma, or on the other, an albuminuric retinitis. In the first instance he endangers the patient's eyesight, in the second, his life. It therefore follows that a proper understanding of ocular therapeutics and of the adaptation of lenses for ocular disorders requires the skill of one who is medically trained in the best sense of that term. The measurement of errors of refraction, anomalies of accommodation and of the ocular motility, with or without the use of drugs, is not a simple mechanical procedure, but represents one of the most important therapeutic measures in the practice of medicine, and must not be lightly undertaken by anyone who is uninformed in the manner we have described. In our opinion it is the province of the optician to manufacture prescribed lenses and to attend to their mounting and suitable mechanical adjustment. It is not, in our opinion, the province of the optician, nor that of any other person unprepared by medical education, to attempt to diagnosticate diseases of, or to prescribe lenses for, the human eye."

M. D. S.

Supervised and Systematic Study of Ophthalmology. Jackson, Edward, Denver, Colo. (*Ophth. Record,* September, 1912). According to the author the educational training and equipment that ought to be possessed by one who would enter ophthalmic practice includes beside an education in general medicine: (a) Knowledge of the minute anatomy of the eye. Not simply of

cell structure and relations, but of small details of topographic surgical anatomy, that are not taught in the anatomical courses of our medical schools. (b) Familiarity with facts in the physiology of vision that are not and can not be taught to all medical students. (c) A course of laboratory work in the pathology and bacteriology of the eye, such as is not and cannot be given in the courses of bacteriology and pathology in our medical schools. (d) A knowledge of optics, that other practitioners of medicine do not require. (e) Acquaintance with methods of examination that differ radically from those employed in other branches of medical practice. (f) Skill in a series of most delicate special manipulations and operations. G. I. H.

Dentistry and Optometry; a Parallel.—Crisp, William H., Denver, Colo. (*Ophth. Record,* January, 1913). The author states, "Schools of dentistry came into existence because the public demand and need for dental work was not being met by the general medical organizations. In view of the neglect by medical schools of another department of medicine, is it very unlikely that, as Mr. Pretnice is bold enough to suggest, the public will recognize its needs in the matter of refraction by constantly improving the legal and educational status of the optometrist."

Crisp concludes with the statement, "Ophthalmologists must not merely be prepared to supply the needs of the public. Unless they wish to see their professional status usurped by a group of men whose preliminary education and ethical principles will generally speaking be vastly inferior to their own, they must display a reasonable willingness to establish some criterion by which their title to the position they hold may be confirmed. Especially in the matter of refraction, ophthalmologists can at present base their claims upon no such definite criterion. The sooner they remedy the omission, the more successful will be the resistance which they can offer to the agitation for optometry legislation; or at least the more efficient will be the safeguards, both in the public interest and as regards their own rights, which they will be able to secure wherever such legislation is enacted. G. I. H.

Should a Man with Miners' Nystagmus Work?—Riseley, Stanley, Sheffield, Eng. (*The Lancet,* March 1, 1913). The writer alludes to the dicussion at the last Ophthalmogical Congress at Oxford at which the following resolution was passed:

"In the opinion of the Congress, the character of the illumination is the chief factor in the production of coal miners' nystagmus,

and that a department committee should be appointed to make inquiries into, and report upon, the exact conditions under which the disease occurs."

As regards prevention of nystagmus, the recommendation is to alter the character of the illumination and to give an improved light, electric light being suggested, and recently a prize was offered by the home secretary for the best miners' electric safety lamp, and was won by a German. It is called the Ceag lamp; it weighs 4½ lb., being a little heavier than the ordinary lamp. It gives a light of about 1.5 candle-power and will burn from 12 to 18 hours, while that of the oil lamp is less than 0.75. The miners find the light of this lamp very good, enabling them to see without straining; it is expected that cases of nystagmus will become less frequent as result of such improved illumination.

There has been an enormous increase of claims by miners on account of nystagmus during the last few years; this is due to the fact that the men are paid full compensation and not required to work when they make such claims in cases of nystagmus. The writer comments upon the injustice of this state of affairs to the mine owners and the injury to the men themselves when allowed to indulge in idleness under these circumstances.

The writer concludes that when a man claims to be and is admitted to be incapacitated by nystagmus, after a reasonable period during which he has been under constant observation, if his condition warrants his being employed, he should eventually resume work under ground, but as a commencement occupation above ground should be provided. He claims to have shown that a man with bad nystagmus can do good work and is no worse for doing it. The attitude of the medical profession towards the disease—viz., that as soon as a man was diagnosed to have nystagmus he should not be allowed to work in the pit, and should be advised never to return—has been responsible in great measure for the present state of affairs. "Seeing, however, that many of us brought in contact with the disease now know that the willing men can work with nystagmus, and are doing so. I should like to plead that a different attitude be taken up, and instead of immediately looking upon a man with nystagmus as totally incapacitated we should, with the exception of serious cases, urge the claimant to continue work, knowing that he can do so without injury to himself."

C. H. M.

MUSCLES.

A Study in Dextrophoria.—Valk, Francis, New York City (*Ophth. Record,* December, 1912). The examination with the tropometer at once reveals the conditions and the indications. If we do have a weakness, or call it an insufficiency, of rotation in an externus and an internus, we have the selection of a prism or an operation, which must be decided according to the experience of the examiner or according to his inclinations. Valk has had good results with a prism over one eye, base in, and over the other eye, base out; this may seem paradoxical, but he think this is the best procedure in simple dextrophoria. G. I. H.

OPERATIONS.

Keratotomy for the Removal of Corneal Scars and Opacities.—Jobson, G. B., Franklin, Pa. (*Ophth. Record,* July, 1912). A perpendicular cut is made with the Keratome around the scar, or opacity, to an extent commensurate with its depth, going through successively the anterior epithelial layer, Bowman's membrane and the substantia propria surface. The success of the operation depends upon the removal of the abnormal tissue in layers, until clear cornea is encountered. If this is done correctly, the surface will be comparatively smooth, clear and parallel with the uncut corneal surface. In other words, the last layer must be intact. Care must be exercised that the underlying elastic Descemet's membrane is not cut into. Jobson has performed this operation upon 15 patients. G. I. H.

Further Communications on the Experimental Implantation of Preserved Corneal Substance in the Cornea of the Rabbit.—Salzer, F., München (*Contributions to Keratoplasty III. Arch. f. Aug.,* 73, p. 109), describes and illustrates the anatomical changes, after 2, 7 and 17 months of the cornea of rabbits, into which he implanted corneal substance of the horse, preserved in formol and then washed in running water and salt solution. The first experiment, for 2 months, took a perfectly non-irritative course. The lobe, 4 mm. thick, cut with the 2 mm. trepan from the stroma of the preserved cornea of the horse and placed into a pocket wound of the cornea of a rabbit close to Descemet's membrane, healed on and remained so clear, that it could only be recognized with the ophthalmoscope by the irregular astigmatism of its borders. Anatomically the lobe was fused with the surroundings almost ideal-

ly. Its center was nearly homogeneous without nuclei. In the marginal zone new formed corneal cells were visible, partly isolated between the fibrillae of the preserved tissue into which they must have immigrated, partly anastomosing by processes like those in the surrounding cornea. At the posterior surface of the corresponding part of Descemet's membrane no deposits were noticeable.

In the second experiment, terminated after 7 months, the process of substitution was farther advanced, but the implanted lobe was also in general without nuclei, showed all over the lamellar fibrillar structure, but looked more compact than the surrounding cornea.

In the third experiment after 17 months nothing definite of the lobe could be recognized with the ophthalmoscope. Its whole area showed irregular astigmatism, the surface was smooth and gave a reflex. The eyes presented nothing abnormal, except slight irritation like in conjunctivitis. Anatomically nothing of the lobe could be ascertained. At its site the lamellae were irregularly arranged and of varying thickness. There was no gap, but traces of coagulated masses and some granular cells. Descemet's membrane was thickened and a granular coagulated mass was deposited on the endothelium. This difference from the other eyes was apparently due to the fact that the lobe in this case lay close to Descemet's membrane, so that albuminous matter from the slow disintegration of the foreign body diffused through the membrane and was deposited on its posterior surface, exerting here chemotactic actions with subsequent accumulation of leucocytes and formation of pigment.

S.'s experiments show that the healing in and the persistence of the implanted pieces are two different things and that also without persistence of the lobe the clinical success of a partial keratoplasty is possible by the substitution of the lobe by regenerated tissue. S. considers it not excluded, that a method of preservation will be discovered which has the advantages of the lobe preserved in formol without its disadvantages. Only if it would be proven, that surviving corneal lobes are transplantable in the true sense of the word, i. e., show after transplantation progressive changes, autoplasty or homoplasty would have to be exclusively insisted upon. Although so far this proof has not been furnished, this procedure deserves so far preference for practice, because the (surviving or not surviving) material of the same species seems to be the most suitable material for promoting regeneration. C. Z.

OPTIC NERVE.

A Case of Retro-Bulbar Neuritis of Toxemic Origin.—Allport, Frank, Chicago, Ill. (*Ophth. Record,* December, 1912). Fundus normal as were the accessory sinuses and nose. Patient had a central scotoma. A diagnosis of retro-bulbar neuritis from intestinal toxemia. Dr. Lewis made a diagnosis of catarrhal jaundice. In ten days patient was discharged and no scotoma could be obtained. G. I. H.

The Optic Disk in Purulent Otitic Disease and Its Complications.—Gruening, E., New York (*Arch. Ophth.,* March, 1913, XLII, 153), calls attention to the importance of differentiating between optic neuritis and choked disk, and to the importance of recognizing the different stages of choked disk, and also to the importance of making careful ophthalmoscopic examinations in all purulent otitic cases. W. R. M.

Contributions to the Treatment of Choked Disc, Especially in Tumors of the Brain, by Decompression, with Temporary Extracranial Drainage of a Lateral Ventricle.—Kaelin-Benziger, Zürich (*Zeit. f. Aug.,* 29, January, 1913, p. 12, February, 1913, p. 138), discusses this question very elaborately from his observations of 35 cases of choked disc, mostly bilateral, within 17 years, and reports in detail 5 cases, seen in the last 3 years, treated with trephining and temporary extracranial drainage of a lateral ventricle. The technic of the puncture of the corpus callosum (Balkenstich), devised by Anton and von Bramann, and the trephining for decompression are exhaustively described.

K. reached the following conclusions: 1. The certain diagnosis of bilateral choked disc is an unconditional indication for decompression of the brain by operation even if the visual function of one or both eyes is still normal. Thus the dangers are less and the results best. 2. The farther the damage to the optic nerve by pressure is advanced, the poorer are the operative prospects for preservation or improvement of function. There is no diagnostic criterion for a spontaneous cure of choked disc, therefore it must not be counted on. 3. Since in most cases of brain tumors the causes of choked disc cannot be removed and the augmentation of the physiological outlets of cerebrospinal liquor is impossible from the start, the only therapeutic measure to be considered is a new permanent outflow of liquor or a permanent enlargement of space for expansion of the brain. 4. As experience shows that a solid

tumor often is complicated by hydrops of a ventricle, the opening must be combined with temporary extracranial and permanent intracranial drainage. Therefore simple trephining can suffice only in very rare cases. 5. If localization is impossible, the parietal region is preferable. 6. K. has no expreience as to lumbar puncture or that of the corpus callosum. 7. In K.'s cases the cerebral symptoms and the choked disc disappeared in from 24 hours to 2 weeks after the operation. None of the patients died in consequence of the operation. 8. In every case the therapeutic plan must be determined by the ophthalmoscopic state of the choked disc, whose subsidence must be obtained under all circumstances.

C. Z.

The Significance of Choked Disc.—Schieck, F., Koenigsberg (*Deut. Med. Woch.*, January 2, 1913, No. 1, p. 10), defines choked disc as the ophthalmoscopically visible expression of an imbibition of the peripheral end of the optic nerve with cerebrospinal fluid, a process which leads to bulging, enlargement and edema of the disc with subsequent phenomena of intense stasis in the territory of the central retinal vein. It is brought about by the entrance of cerebrospinal liquor into the preformed perivascular lymphatic spaces of the axial bundle of the optic nerve and along the central vessels into the disc. The cause of the phenomenon is excessive pressure of the liquor in increased intracranial pressure (brain tumor, meningitis, etc.), or in local stasis of the fluid in the intravaginal space of the optic nerve (tumors and inflammatory processes in the orbit), persistent decrease of intraocular tension (after injuries of the eye) and collapse of the vessels of the axial bundle after profuse hemorrhages. S. proved this by the constant anatomopathological condition and the following experiments: The phenomenon of choked disc can be elicited in the optic nerve of any cadaver if through a fine canula, fastened into the intravaginal space proximal to the axial bundle, salt solution is injected under moderate pressure. The fluid at once spreads into the perivascular spaces of the axial bundle and creates not only edema, which can be microscopically ascertained, but also the typical changes of choked disc at the hilus of the disc. Thus it is possible to increase enormously this characteristic phenomenon on eyes of cadavers with choked disc. In such a manner S. obtained specimens, in which the central vessels in the axial bundle were surrounded by a system of wide gaping spaces, exceeding in extent the lumen of the central vessels. In the monkey, whose central vessels show the same course

as the human, choked disc can be produced by injecting fluid under the dura mater of the cranial roof, which ophthalmoscopically and microscopically is identical with that in man. Incipient choked disc at first presents a bulging of the limitans interna at the hilus of the disc by an effusion of fluid, then filling of the sheaths of the larger veins emanating from the disc, soon followed by a streaky opacity of the adjoining retina.

For a closer study of Schieck's experiments we refer the reader to his valuable monograph, which we reviewed in *Ophthalmology*. Vol. 4, No. 7, July, 1911. C. Z.

OPTICS.

On an Achromatic Loupe of Weak Magnifying Power in Form of Spectacles.—von Rohr, M., and Stock, W., Jena (*Klin. Mon. f. Aug.*, 51, I, February, 1913, p. 206), describe a binocular loupe, manufactured by Zeiss, which gives perfect stereoscopic vision, is adjusted to a distance of 25 cm. from the object which is seen under 2 diameters, and weighs only 15.00.

C. Z.

ORBIT.

The Treatment of Pulsating Exophthalmos with Case Report.—Bucgtel, Frost C., Denver, Colo. (*Ophth. Record*, February, 1913). Three months before operation patient was struck on the head by a pitchfork and noticed thereafter a buzzing sound in the head which was followed in a few days by a protrusion of the left eye. The operation is described by the author as follows: An incision in the eyebrow two inches long made from a point very near the middle line. The skin flaps were turned up and down. Many dilated superficial veins were cut which required ligature. The angular vein and superficial temperal were both dilated and were cut. The superior ophthalmic formed by the junction of the two radical above named was followed into the orbit, back as far as possible without damage to the eyeball and ligated with plain cat gut. A subcuticular stitch of plain cat gut brought the skin surfaces together. The exophthalmos has gradually diminished until now, three months after, there is practically no difference between the two eyes. G. I. H.

Orbital Cellulitis With Report of Case.—Holdsworth, F., Traverse City, Mich. (*Ophth. Record*, June, 1912). The case described began as an infection in ethmoid cells, which was trans-

mitted to the orbital contents by forcible irrigation or excessive blowing of nose. A curved incision was made, continuous with eyebrow on inner side or orbit, about one inch in length and periosteum elevated over ethmoid. At present, patient's general condition is improved, vision is normal and cosmetic result is satisfactory.

G. I. H.

PATHOLOGY.

Calcareous Degeneration of the Cornea and Lens Capsule.—Tooke, Fred'k, Montreal, Canada (*Arch. Ophth.*, January, 1913, XLII, 17), reports a case of calcareous degeneration of the cornea and lens capsule in a patient who had injured his eye one and a half years previous to admission to the hospital. A round, dense scar covered the center of the cornea and a chronic glaucoma was present. Examination of the enucleated eye showed the anterior capsule of the lens to be of the appearance and consistency of an eggshell and clinical tests showed it to be calcium carbonate. Examination of sections of the cornea showed similar calcareous changes.

The author believes the condition present in lens capsule and cornea to be a primary degenerative process not preceded by previous inflammatory alterations.

The article is illustrated.

W. R. M.

On the Anemic Fundus.—Salzmann, M., Graz (*Zeit. f. Aug.*, 29, January, 1913, p. 30). The anemic fundus is a physical consequence of the pathological condition of the blood and presents a typical ophthalmoscopic picture. It may occur in all kinds of intense anemia, but is most marked in aplastic anemia of small children. S. describes the fundus, with colored illustrations, of 4 cases. A child, aged 11, suffering from pernicious anemia with one-half of the normal amount of hemoglobin, exhibited the first and most important symptom of the anemic fundus, the translucent column of blood. The vessels were much lighter on the disc than on the fundus, the reflex stripe was scarcely visible on the disc and the sharp border of the disc shone through the vessels. The disc was somewhat paler, the fundus of normal red coloration.

In the second case, a girl, aged 12, with congenital hereditary splenomegaly and chronic anemia, the percentage of hemoglobin was only 34. The blood column was tranlucent and very light, especially in the veins, so that the difference of color between veins and arteries was diminished. The disc was not pale, but the fundus yellowish and peculiarly granulated.

This third characteristic sign was still more marked in a girl, aged 1½, with hemoglobin of from 17 to 24%, and light hair. The vessels on the disc appeared as pale reddish bands without reflex stripes, the disc was pinkish, not white or grey, but the physiological differences between nasal and temporal portions were lacking. The yellowish color and granulation of the fundus were very marked.

All these phenomena were much more pronounced in the fourth case, a girl, aged 1½, with aplastic anemia, only 16% hemoglobin, and brown hair. The disc was very pale, but not entirely devoid of the reddish hue. The vessels were so indistinct that the grouping of the main branches at the hilus could not be recognized in the inverted image. At the fundus only the largest vessels were visible. The veins were wider, and quite tortuous at the periphery. The fundus was yellow and granulated.

S. ascribes the granulation to the unequal pigmentation of the single pigment epithelia, just as in the normal eye. That it is so clearly visible in anemia must be due to the fact that the underlying chorioid is unusually pale.

S. reached this conclusion from the fifth case, a child aged 4, with anemia and hemolytic icterus, with 40% hemoglobin. On admission the yellowish color and granulation were very marked. But after the anemia was very much improved in a month, the fundus had the aspect of a light blond individual, viz. distinctly visible chorioidal vessels with light interstices, and the granulation was not more intense than ordinarily. What is seen in the very anemic fundus is so to speak the pigment epithelium, whereas in the normal eye the red of the underlying chorioid is added. Here the granulation becomes less distinct by the diminished contrast between the lighter and darker cells, because the fundus in general is more intensely colored.

Other changes in anemia, as pulsation, alterations of caliber of the vessels, swelling of the disc, opacities and extravasations in the retina, are complications to which, besides anemia, other disturbances are necessary e. g. of heart action, vascular walls, etc.

C. Z.

PHYSIOLOGY

The Simple Character of the Yellow Sensation.—Edridge-Green, F. W. (*Phys. Proceedings,* March 15, 1913). Concludes as follows: There is no evidence of the compound nature of the yellow sensation, any effects due to considerable fatigue are due to the subtraction of the fatigued color sensation and the super-

position of the after-image on that of the reacting light. This after-image may in certain conditions be seen more clearly in the absence of light than when projected on a surface reflecting light.

The color of spectral light of low luminosity is incompatible with any form of the trichromatic theory, but is exactly what we should expect on the view that yellow is a simple sensation. If a region of pure yellow be isolated in my spectrometer it will appear yellow when the luminosity is gradually diminished until the region appears colorless. The yellow appears less and less saturated but does not incline either to green or orange. If the yellow were compounded of a red and a green sensation it should become greener on diminishing the luminosity because the red of the spectrum disappears much sooner than the green. The red component of the yellow would disappear whilst the green would remain. The luminosity is diminished by moving the light on a photometer bench. The same is found with pure blue which does not incline to either green or violet when the luminosity is diminished. M. B.

The Deficient Results in the Experimental Findings Regarding the Fluid Current of the Eye.—Kuschal, J., Luedenscheid, Germany (*Ann. Ophth.,* April, 1913). The discussion at the eighty-second meeting of German Nationalists and Physicians in Königsberg "On the Fluid Currents of the Eye" resulted in a conclusion which approaches suspiciously close to a declaration of bankruptcy in the experimental method of research. O. Weiss in summing up the views says, it has not been possible to show directly that the aqueous humor is in a state of current movements and that no proof is at hand that there is an exit current. Th. J. Bürgers reported upon the bacteriologic and serologic result of the investigations acknowledged a current change, but considers it small. K. Wessely dealt with the subject from the ophthalmologic standpoint and endeavored to harmonize the standpoint of the oculist, who contends that a fluid current occurs from the ciliary body to the anterior chamber, with the bacteriologic experience. From the conclusions found in the reports of the convention of 1910 it is apparent that concerning the fluid circulation in the eye, we for years have taken no step in advance. It may be accepted as surely proven that a current of fluid originating from the ciliary body or from the blood capillaries of the ciliary process, pass through the pupil into the anterior chamber and makes its exit into the vein of the canal of Schlemm; all else is not proven. He does not admit that the elements of nutritional transmission and requirements are admissible and he disagrees with Wessely in his contention that the

first function of intraocular fluids is an optic and static one and that they represent only in a second degree fluids of nutriment. Manometry of the eye proceeds from the proposition that the eye is a simple capsule filled with fluid, an assumption which is fundamentally wrong. Investigations by the use of staining agents possess but little value except insofar as the lens is concerned. He concurs with Schlösser on the fluid current of the lens, that the nutriment fluid enters the lens at the equator, from which point it passes to the posterior pole through the posterior lens star into the perinuclear canal system, finally, after entering the anterior lens star, making its exit through circularly arranged orifices on the anterior surface. The act of accommodation plays a part by creating spaces in the lens which act as a suction and force pump, the nuclear crescent acts as a valve and forces the current to turn toward the perinuclear region. M. B.

The Successful Proof of the Intraocular Fluid Current Based on the Principle of Mechanical Adaptability.—Kuschel, J., Lüedenscheid, Germany (*Ann. Ophth.*, April, 1913). The anatomic facts show that the construction of the eye is a harmoneous one and that the opinion of an adaptive architecture is justified. The aim of this is the conservation of the function of the organ of vision. For this reason the retina is located at the middle point of the harmonious structure. But the function stands in the need of protection, since, as is the case in all biomechanic constructions, there constantly occur oscillations in the tensions, due to the blood and fluid currents as well as the motions of the body. The architecture of the eye is a regulating mechanism for the intraocular pressure and current fluctuations. The architecture from the standpoint of statics, presents the properties of a framework equipped for the elements determining the character of the organ, the visual cells and their nerve conductions on the one hand, and the optic constituents on the other. The sclerocorneal capsule represents an external tissue skeleton, while the internal architecture presents the character of an internal skeleton. This internal structure acts as interposing obstructions to the current flow and serves to balance the pressure fluctuations and produce an uniform current. The choroid is likened to an erectile body and capable of causing centripetal pressure through the retina upon the vitreous, thus closing the canal of Cloquet with a general tendency to forward pressure upon the zonula-lens system, the fluid pressure is propagated anteriorly into the anterior chamber so that an augmented filtration into the canal of Schlemm ensues. He assumes

a valve like action in the canal of Cloquet and in the zonular fissure and thinks it is largely responsible for equalization of pressure by reversal of valve action. During the erectile period of the choroid there is an arrest of secretion from the ciliary body, but during the period of reversal the ciliary secretion is augmented. M. B.

Remarks on the Intraocular Tension of the Moving Eye.—Halben, R., Berlin (*Arch. f. Aug.*, 73, p. 129), mentions, that he observed with the tonometer of Livschitz increase of intraocular tension in contractions of the ocular muscles under exclusion of pressure by the lids. He considers the experiments of Lederer (reviewed in Ophthalmology) as corroborating his argumentation for the necessity of increase of intraocular tension in associated movements of the eyes. C. Z.

To the Question of Increase of Intraocular Tension in Movements of the Eye.—Levinsohn, G., Berlin (*Arch. f. Aug.*, 73, p. 151), shows that the experiments of Lederer and Wessely (reviewed in Ophthalmology), do not contradict, but confirm the conclusions drawn from his own experiments. The occasional slight excursions of the tonometer of Schioetz in his experiments, which he attributed to minute concussions of the eyes, corresponded with the observation of Wessely, that especially rapid movements of the eye increased the intraocular tension. This fact that the increase of tension can be only very slight and of mimimal duration, is of paramount importance. For it proves the impossibility, that during near work by convergence, the minute oscillating movements in reading and the slight fixation downwards the eye is subjected to the damaging influence of increased tension, even if now and then exceptionally a mimimal rise of tension did occur. With this proof he considers all theories refuted which ascribe the etiology of myopia to increase of intraocular tension during near work.

C. Z.

Analytic Investigations on the Fluorescence of the Human and Bovine Lenses.—Vogt, A., Aarau (*Klin. Mon. f. Aug.*, 51, I, February, 1913, p. 129), reports in detail on his numerous and careful investigations on normal and pathological lenses in vivo of individuals of from 1 to 75 years, on about 40 fresh lenses of human cadavers, some recently extracted cataracts and very many lenses of calves and cattle of different ages. All lenses were placed on porcelain dishes and exposed to different kinds of rays, viz.: 1. ultraviolet, 2. violet, 3. blue (adulterated by violet

and green), 4. violet blue (adulterated by green), 5. violet+blue+ ultraviolet (adulterated by red and green). In this manner he corrected and supplemented the extant results on the fluorescence of the lens. Helmholtz's observation of the whitish blue fluorescence of the lens is only conditionally correct and the results of the other authors as to the fluorescence in ultraviolet are not conclusive on account of insufficient methods.

V. made the following observations: 1. The human and bovine lenses fluoresce in whitish blue color in the ultraviolet of the arc light. This whitish blue is modified and tinted yellowish green, if it is filtrated through yellow lens substance which weakens its blue and violet components. The degree of this modification depends on the intensity of the yellow coloration of the lens and the thickness of the structure, through which the fluorescent light is filtrated, and on the intensities of the fluorescence and the admixed ultraviolet. 2. Violet light produces fluorescence only in yellow lenses. Colorless lenses, c. g. of the calf transmit the violet unaltered and therefore do not fluoresce. But the human lens always fluoresces in violet, even in earliest infancy, on account of its yellowish coloration. Thus the fluorescence of the lens also shows that without absorption there is no fluorescence imaginable. The fluorescent light of violet is from yellowish green to yellow and equals qualitatively in its composition to that produced by the ultraviolet, but does not contain ultraviolet. 3. The fluorescent light of blue is of slight intensity. Its origin also depends on the absorption of the exciting light, required a still more intense yellow coloration of the lens than that of the fluorescence by violet. This fluorescent light contains no ultraviolet nor violet components. 4. In the light nebula produced by ultraviolet the yellow color of the lens can be perceived entoptically. 5. The objective proof of the presence of the lens in the eye can be made by means of the fluorescent light in cases in which this is impossible by any other method, e. g., in pupillary exudations. The disadvantages for sight ascribed by Schanz and Stockhausen to the fluorescence of the lens do not exist. In day light the fluorescence cannot be perceived objectively or subjectively. The diffuse light nebula in radiation with ultraviolet light is not identical with the fluorescence of the lens, as asserted by Schanz and Stockhausen, but only a small part of it. V. showed that it is also caused by rays which do not produce fluorescence.

C. Z.

On the Treshold Value of the Pupillary and the Extent of the Pupillomotor Area of the Retina.—Schlesinger,

Ertel, Berlin (*Deut. Med. Woch.*, January 23, 1913, No. 4, p. 163), approached these problems by new methods. In the first place an absolutely constant source of light is required for a measuring apparatus, which works with variations of minute intensities of light. S. found this in the acetylene light, while the electric light cannot be used. The second problem is that of the diffuse light of dispersion. Not only the diascleral light prevents exact measurements, but, as C. Hess showed, also the light striking the blind spot elicits a pupillary reaction by dispersion. Then the size of the image of a luminous object on the retina varies with the anomalies of refraction. As it is very probable that, at the same intensity, luminous surfaces of different sizes have different pupillomotor values, an arrangement is necessary which allows to focus exactly on the retina the image of a luminous object of equal intensity and size in all states of refraction. Finally every accommodative movement must be excluded.

S. describes in detail his peripupillometer which he constructed with Carl Zeiss of Jena for the solution of these problems. His results were: 1. In normal persons of the same age the treshold value is almost constant. 2. The pupillary reflex after repeated exposures to the exciting light at short intervals shows symptoms of exhaustion. 3. The time of reflex, i. e., the time intervening from the moment of exposure to the light to the visibility of the contraction, decreases after repeated radiations.

It is a fundamental condition, that any examination of the reflex area of the fundus must start with the determination of the threshold value of the pupillary reaction. This follows from the observation that a weak light of the size of 1/50 of the optic disc directed upon the blind spot produces a pupillary reaction and the perception of a halo, but not if the intensity falls below from 0.3 to 0.4 candle power (M. K.). Therefore only intensities of light can be used which emit light of dispersion below the treshold value. The radius of the reflex area of the retina equals the tangent of the angle of incidence multiplied with the posterior focal distance, and is at least 5 mm. in healthy persons of middle age. Hess found 3 mm. S. succeeded with his apparatus in ascertaining hemiopic pupillary reaction in two cases. C. Z.

REFRACTION AND ACCOMMODATION

Anisometropia. — McMullen, W. Hallibuton, London (*Ophth. Review*, December, 1912). The writer gives his experiences and advice regarding the prescription of glasses that can be

worn with comfort in persons whose eyes present unequal refractive power.

The discomfort caused by the use of the unequal glasses required to correct unequal errors of refraction is attributable to several causes: (1) Artifical heterophoria produced by the unequal prismatic effects of the lenses when the visual axes do not pass through their optical centers, varying as the eyes are turned to look in different directions, causing continual changes in the degree and kind of heterophoria produced, and calling for corresponding changes in the muscular adjustments required to correct it. (2) Correcting lenses cause changes in size of the retinal images unless their optical centers coincide with the anterior focal points of the eyes, and this condition is seldom fulfilled in practice. (3) Differences in the amount of the optical aberrations produced by the unequal lenses, causing slight differences in form and definition of the images, especially when the visual axes pass obliquely through the glasses. (4) Inequality in the effects of accommodation in the two sides may be a factor but is probably not a very potent one.

The writer discusses these various causes and gives interesting examples of anisometropia with the corrections which finally gave comfort showing the impossibility of fixing any limits as a guide to practice, and demonstrating that each case must be judged on its own merits; if even the smallest power of binocular vision be present it may be necessary to correct both eyes to give relief from symptoms of eye-strain, although the difference between the eyes be very great.

This experience leads him to advise as follows: "When both eyes are ametropic, the visual acuity of both good, and binocular vision well developed, glasses correcting both eyes should always be given. If they cause discomfort, two pairs, very carefully centered for distance and reading, should be given, and the patient advised to persevere in their use for several weeks at least. If, in spite of careful adjustment of glasses and several weeks' trial these are uncomfortable, it will be necessary to leave one eye undercorrected. When both eyes are ametropic, and binocular vision is defective, it is best in the majority of cases to correct both eyes, unless the visual acuity of one eye is so bad that the development of binocular vision is out of the question. In children, of course, there is much more chance than in adults of developing the visual acuity when defective, and there are few cases in which the correction of both eyes can be regarded as obviously useless. If one eye is emmetropic, or nearly so, it may be difficult to decide whether glasses should be prescribed or not. In the case of children one has to consider

whether the development of binocular vision will be an advantage sufficiently great to outweigh the disadvantage of wearing glasses continually, bearing in mind that in some occupations the wearing of glasses is a serious handicap to progress. In older patients one's decision will be influenced chiefly by the presence of absence of symptoms of eye-strain. C. H. M.

A Simple Method and Equipment for Quickly and Accurately Determining Lenses to Correct Astigmatism.—Sulzer, D. E., Paris (*Ann. Ophth.*, January, 1913). He proposes that cylinders be orientated according to the minimum of their convergence action; for example, a plus cylinder has its axis marked at right angles to its principal meridian of refraction and a minus cylinder has its axis marked in accordance with the principal meridian of refraction. He proposes that the cylinders instead of being round be made rectangular, and that the longest side in each cylinder conform to the direction of the axis. This would of course require a change in the shape of the retaining cell in the trial frame. He further suggests a change in the marking of the dial to that of zero being at the top of the vertical meridian or 12 o'clock, 90° at 3 o'clock, and so on. M. B.

Eye Strain in the Tuberculous.—Orendorff, Otis, Canon City, Col. (*Jour. Ophthal. and Oto-Laryngology*, April, 1913, VII, 103), discusses the importance of nervous conditions in tuberculosis and the relation of asthenopia to nerve exhaustion and to tuberculosis. He emphasizes the fact that, in a person in feeble condition of health, a very small error of refraction may cause serious trouble and delay recovery, and that great care should be taken in refracting the tuberculous. W. R. M.

The Importance of Accurate Refraction.—Crisp, W. H., Denver, Colo. (*Journ. of Ophth. and Oto-Laryng.*, August, 1912). The author deals with the usual errors of refraction in a practical manner. Crisp uses a cycloplegic in every suitable case and states, "Even in the hands of the most careful and expert refractionists, there are many cases in which a proper estimation of the patient's refractive condition is impossible without the use of a cycloplegic." G. I. H.

Refraction and the Use of Cycloplegics With Especial Mention of Hyoscin.—Harris, Clarence M., Johnstown, Pa. (*Journ. of Ophth. and Oto-Laryng.*, September, 1912). The author

uses one-tenth per cent hyoscin with about one per cent cocain hydrochlorid used in the same way, in all persons under forty years of age, who will submit to it, using homatropin in those between the ages of forty and fifty when indicated and in brief cycloplegia in those over twenty five. Merck's hyoscin hydrobromid and triturate one grain in it with eight grains of cocain hylrochlorid. One-half grain of this is practically equivalent to one-sixteenth grain of hyoscin and one-half grain of cocain; this is weighed and placed in a clean vial. When prescribed, one dram of water is added, giving an absolutely fresh solution. G. I. H.

Anomalies of Refraction and Their Relation to Abnormalities of Ocular Balance.—Risley, S. D., Philadelphia, Pa. (*Ophth. Record,* July, 1912). According to the author comfortable vision with two eyes depends upon the harmonious relation of so many factors, anatomical, physiological and optical, that we should not find cause for surprise if, in so complex a system as the combined ocular apparatus, we observe frequent disturbance of function growing out of abnormal variations in one or more of these factors. G. I. H.

The Value of Prisms in Eye Strain.—Green, A. S., San Francisco, Cal. (*California State Jour. Med.,* November, 1912). In dealing with refraction cases, the following methods have been eminently satisfactory to the writer:

1. In hyperopia with esophoria for distance and near, give a full correction of the refractive error, to be worn constantly. This will relieve the strain on the ciliary muscles and internal recti.

2. In hyperopia with orthophoria for distance, and 3 degrees to 4 degrees of exophoria near, an under correction of the hyperopia will usually suffice.

3. In hyperopia with orthophoria for distance, but 6 degrees to 10 degrees exophoria for near, give a partial correction of the hyperopia, combined with 1 degree to 3 degree prism base in over each eye, for near use only. The interni in such a case need the prisms at the near point, but would not tolerate them for distance.

4. In hyperopia with 6 degrees to 8 degrees of exophoria for distance and 10 degrees to 12 degrees near, give a partial refractive correction combined with a 1 degree to 3 degrees prism base in over each eye for constant wear.

5. In hyperopia with esophoria combined with hyperphoria, the correction of the refractive error will frequently correct the muscle imbalance.

6. In hyperopia with exophoria combined with a hyperphoria, it will usually be necessary to correct a part of the hyperphoria as well as a part of the exophoria.

7. In myopia with exophoria, give the full refractive correction. This may have to be modified in an adult who has never worn glasses, so as to avoid retinal fatigue.

8. In myopia with esophoria, an under correction of the refractive error with decentration of the lenses will be indicated.

These rules are only general, and variations will have to be made in individual cases, as to the strength of the focal corrections and prisms. Where the refractive correction will allow, it is better to decenter a lens rather than order a prism. Lenses are now made allowing a decentration of 5 to 6 mm. Decentering a 1 D lens 10 mm. gives a prism of 1 degree, so that in the stronger lenses it is often easy to obtain the desired prismatic correction by decentration. It is well to see that the patient does not get an undesired prismatic effect due to faulty adjustment of the glasses. One frequently sees glasses with their optical centers too wide or too narrow, with a consequent eye strain. This is quickly relieved in many cases by a proper adjustment of the frames.

In conclusion, it may be well to call attention to the correction of presbyopia. Along with the failure of the accommodation, we frequently have a weakened convergence. The internal recti, as well as other muscles of the body, undergo senile atrophy, which is, strictly speaking, a physiological process. In such cases, if the lenses are decentered in, the patient will often be more comfortable.

G. I. H.

The Symptomatology of Eyestrain.—Kahn, W. W., Detroit, Mich. (*Indianapolis Med. Journ.*, November, 1912). The body is likened to an electric light circuit. The current comes from food energy, the nerves carry the current and the vital organs are equivalent to the light bulbs. If a given electric plant is capable of maintaining 100 one-candle power lamps at a given brilliancy, and a ten-candle power lamp be inserted, the brilliancy of all the lamps is reduced. If, however, the plant has more power than is needed by the 100 one-candle power lamps, it may be possible for it to accept of the insertion of the 10 candle-power lamp and the brilliancy of all the lamps not be reduced. He likens the ametropic eye to the 10 candle-power lamp. So long as our generator can supply the nerve power no part suffers, but as soon as it cannot then some part does suffer. It may be the eyes, it may be some

individual organ or that every organ is supplied with deficient nerve force.

He says that asthenopia and eyestrain should not be used as synonomous terms, that eyestrain is the result of asthenopia. Asthenopia is defined as weak-sightedness, inability to use the eyes without suffering. Eyestrain results if such eyes are used too much. He divides asthenopia into two headings, nervosa and muscularis. The nerve form may be due to retinal exhaustion, which is rare, or to the more frequent form of neurasthenic asthenopia. They differ from the muscular type by immediate symptoms of discomfort following use of eyes, whereas prolonged use of eyes is necessary before symptoms arise in the muscular form. M. B.

RETINA

Retinal Changes in Adolescents.—Knapp, Arnold, New York (*Arch. Ophth.*, January, 1913, XLII, 1), reports four cases showing retinal changes occurring in adolescents, in which the primary pathological change took place in the wall of the retinal veins. Tuberculin treatment in one case was successful; in one doubtful; in two it was without results. The author believes that the relationship of these retinal changes to tuberculosis is probable.

W. R. M.

Treatment of Detachment of the Retina.—Savage, G. C., Nashville, Tenn. (*Ophth. Record*, July, 1912). Under cocaine anesthesia I inject 15 minims of a solution of citrate of sodium, 25 grains to the ounce. The author concludes with: "The fact of exosmosis, brought about by the subconjunctival injection of the solution of the citrate of sodium, makes my guess as to the acidity of the separating fluid appear correct." G. I. H.

An Inquiry Into Results of the Established Treatment of Detachment of the Retina, and a New Theory.—Vail, Derrick T., Cincinnati (*Ann. Ophth.*, January, 1913). The writer communicated with 460 oculists of the United States asking for information as to whether they had had any success in curing any case of *nontraumatic* retinal detachment permanently and requesting information concerning the treatment used. He received 281 replies, which he now compiles in alphabetical order. He gives the methods of treatment used, and there are a great many. Regarding results, 250 of the 281 never cured a single case; many had promising temporary results, but in the end failures. These failures represented probably an experience with 25,000 cases. On the

other hand 31 oculists met with cures, 25 with a single cure each; in some of these the "cure" is not convincing and this leaves about 20 cases of cure, or less than one cure in every 1,000 cases.

In the light of such overwhelming defeat, the writer claims that vigorous treatment is inhumane, ought to be refrained from, and that we ought to resort to nothing but the mildest measures until we have a "cure" which cures.

He next advances the theory that in this condition there is a paralysis of the secretory function of the ciliary processes and that the secretion of aqueous is suddenly arrested; the ocular drainage channels remaining normal the watery elements escape, thus causing minus tension, and this is followed by passive hyperaemia of the blood vessels of the tunica vasculosa, permitting diapedesis and transudation; the vitreous contracts because it loses its percolating supply of aqueous. Continuing to explain his theory, he maintains that the subretinal transudation is highly albuminous; the watery elements ooze away and are replaced by fresh serum, a poor substitute for aqueous; the tissue colloids and circulating colloids imbibe all the moisture they can; the reaction of the transuded juices becomes altered to a less than normal alkaline or an actually acid state.

He next considers the causes of paralysis of the secretory function of the ciliary processes under two heads; acute local and systemic and chronic local. Acute local from concussio oculi, dazzling, certain drugs which paralyze secretory function, like belladonna, duboisin, etc., where the patient has idiosyncrasy or the proceding equatorial chorioiditis, or myopia.

Acute systemic from certain toxemias like those of albuminuria, diabetes, possibly acetone, indican, etc., which have a paralyzing effect on the delicate secretory function of the ciliary processes, or cause an acute inflammation of the cervical sympathetic nerves or ganglia.

Chronic local from slowly progressive atrophy of the secreting epithelium of the ciliary processes, causing a gradual loss of function. This may result from equatorial chorioiditis extending forward to involve the ciliary processes, myopia of high degree, atrophy of the ciliary body in advanced presbyopia, etc.

In myopia the ciliary body becomes greatly atrophied from nonuse; myopia is found in 60 per cent of the cases of detachment. Age causes vascular sclerosis everywhere, and this leads to diminished physiological function; a sudden exciting influence may cause the ciliary body to lose its weakened function entirely. To reverse

the argument: Given loss of secretion of the aqueous, what would result? Answer: Minus tension, deep chamber, dilated pupil, contracted vitreous and detachment of the retina. He believes there are many other arguments to sustain this theory, though he has touched upon only a few.

Next he takes up the question of treatment. If arrest of secretion of aqueous is the cause we cannot expect any results from the many forms of treatment now in use. An attempt should be made to re-establish the aqueous flow by "alkalinizing" the intraocular fluids, which may be done by subconjunctival injections of sodium citrate after Fischer's ideas. Second, by inducing a return of normal aqueous secretion by local measures such as hot fomentations and general measures such as alkaline purgatives, sweats, sodium salicylate, pilocarpin and the iodides. Third, by treatment of the cervical sympathetic ganglion and nerves, such as rubefacients, blisters, massage, electricity, general depletion and alteratives. These measures should be preceded by a good mercurial purge, followed by salts, rest in bed in a dark room, roller bandage to sustain the tension of the eye, for the minus tension prolongs the paralysis of aqueous secretion, and in fact all those measures and only those which have for their central idea the re-establishment of the secretory function of the ciliary processes. C. H. M.

SCLERA

The Intrascleral Nerve Loops.—Attias, G., Munich (*Ann. Ophth.*, January, 1913). Translated by Clarence Loeb, St. Louis. Axenfelt has previously reported a peculiar course of the ciliary nerves in the anterior portion of the bulbus. It was a case where the nerves, after they had traversed the suprachorioidea and had reached the flat portion of the corpus ciliare, passed perpendicularly through the sclera and frequently touched the conjunctiva, after which they turned, passed through the sclera in the opopsite direction and then spread out in the corpus ciliare. These nerves, therefore, formed a loop in the sclera, and were called intrascleral nerve loops. Subsequent reports of cases followed by Naito, Fritz, Groenouw and Meller. The author has found during the examination of scleral sections of the anterior portion of the bulbus three cases of intrascleral nerve loops. These loops are found usually in the superior portion of the eye. The distance of the loop from the limbus varies from 3.5 mm. to 1.7 mm. The loop itself can be divided into a proximal and a distal portion. The path of the loops through the sclera are usually perpendicular, but may be

oblique and even run some distance within the scleral fibers. Nerve branches may shoot off from the loop and run to the cornea. It is unusual to find more than one loop in any one bulbus. The author examined one eye in which two loops were found, one large, the other small. The author describes minutely the course and histology of the fibers in the scleral loops and presents a colored sectional drawing illustrating the condition. M. B.

SINUSES

Some Notes of Visual Disturbance Due to Diseases of Nasal Accessory Cavities.—Moulton, H., Fort Smith, Ark. (*Ann. Ophth.*, April, 1913). Five cases are reported. The first two were cases of ethmoiditis and suffered from severe and persistent headache until the nasal conditions were operated upon. The third was a case of a young man who suffered from severe headaches and partial blindness in one eye, who was relieved after a discharge from the nose of a large amount of pus. Case four was in a woman of twenty-five who suffered from a displacement of the eyeball and obstruction of the retinal circulation due to mucocele of the frontal and ethmoid sinus, who was relieved by a radical operation. Case five was similar and had marked exophoria. A radical Killian disclosed a sarcoma which had destroyed the ethmoids on each side. Recovery was good, with no recurrence since 1909. M. B.

SYMPATHETIC OPHTHALMITIS

Migratory Ophthalmia, Followed by Recovery of Useful Vision.—Fisher, W. A., Chicago, Ill. (*Ophth. Record*, December, 1912). The author emphasizes the importance of waiting a long time after all inflammatory symptoms have subsided before doing any kind of an operation on an eye that has become quiet after sympathetic inflammation. G. I. H.

Blood Changes in Sympathetic Ophthalmia.—Gradle, Harry S., Chicago (*Jour. Ophth. and Oto-Laryngol.*, February, 1913, VII, 35), refers to his previous report, at the Thirty-sixth Heidelberger Congress, of the blood changes in sympathetic or impending sympathetic ophthalmia. He stated that these changes consist in a relative increase in the monoclear elements of the white cells at the cost of the polynuclear elements, particularly the polynuclear neutrophiles. From his observations, the author stated that a mononucleosis, developing during the course of a

traumatic uveitis, was of diagnostic significance in predicting the outbreak of a sympathetic ophthalmia.

Since his first publication the author has observed the blood in fifteen cases of perforating injury of the eye with subsequent iridocyclitis. In all cases, where an enucleation was done, there was a marked increase in the mononuclear cells, and he found that a large percentage presented the anatomical picture that Fuchs calls characteristic of sympathetic disease.

The author believes that the value of the blood picture found after perforating injury of the eye is equivalent to the value of the Pirquet reaction in tuberculosis.

He adds that "mononucleosis, occurring after a perforating injury to the eye, denotes an antigenic absorption of disturbed uveal pigment which under favorable, or rather unfavorable, circumstances, can lead to an outbreak of sympathetic ophthalmia. Absence of mononucleosis under such conditions means that there is no danger of a sympathetic disease appearing. But the presence of the blood changes does not mean necessarily an outbreak of trouble, merely the possibility of sympathetic disease." W. R. M.

Sympathetic Ophthalmia and Tuberculosis.—Stoewer, P., Witten (*Arch. f. Aug.,* 73, p. 155), reports two cases of apparent sympathetic ophthalmia. The first, a man, aged 21, came ten weeks after a perforating injury of the right eye with bilateral plastic uveitis and total synechia of the pupillary margin and exudations on Descenet's membrane. As the regular treatment was not successful, and a diagnostic tuberculin injection elicited a marked general reaction, a tuberculin cure with bacillar emulsion was instituted and was followed by striking improvement.

In the second case, a woman, aged 56, a cataract extraction two years ago was complicated by iridocyclitis, which resisted all treatment. After a few weeks iridocyclitis on the second (right) eye set in. When S. saw her she had mature cataract on this eye, with very opaque capsule. V in both =0. The extracting of the cataract was smooth, but was also followed by plastic iridocyclitis with numerous deposits on Descemet's membrane. This did not show any improvement until the patient was treated with tuberculin injections.

S. considers both cases analogous to those described by Bernheimer and Zirm, and as an additional proof for the fact, that sympathetic and tuberculous uveitis may very closely resemble, and one must think of tuberculosis in inflammations of the uvea, even if the clinical picture has nothing typical of tuberculosis. C. Z.

TOXICOLOGY.

THE INFLUENCE OF SEPTIC INFECTION IN THE CAUSATION OF EYE DISEASE.—LANG, B. T., London (*Brit. Med. Jour.*, February 22, 1913). The writer points out that in the majority of cases of scleritis, keratitis, iritis, cyclitis and chorioiditis, the cause of the affection is obscure. Excluding physical damage, the chemical effects of bacteria or other toxins is regarded as that cause. Bacteria cannot arise within the eye by a process of biogenesis; they or their toxins come from without, brought by the blood stream. Histological demonstration of the bacteria in the inflamed tissues is out of the question, because no eye is ever excised during the onset of the acute stage. Direct evidence is therefore unobtainable, and the views here expressed are based on the evidences that have been obtained by treating the supposed source of the infection. Septic foci occur in three situations: 1. Along the respirato-alimentary tract. 2. Along the genito-urinary tract. 3. On the skin or in a sinus leading from it.

The views of the writer are based upon an analysis of 176 cases which occurred in his father's practice. He cites the histories of many chronic inflammatory diseases of the eye all dependent upon infection influences. The areas of septic inflammation which give rise most often to eye troubles are those that are subjected to frequent mechanical disturbances such as infections of the gums, which are massaged at each meal, or the male urethra, which is continuously disturbed during micturation.

The histories of the cases cited in evidence are exceedingly interesting and seem to show without any doubt the frequent dependence of ocular inflammation, especially of the uveal tract, upon septic food.

"Patients often suffer from some chronic inflammatory lesion for years without ill effect: then perhaps after some minor ailment which reduces vitality, such as exposure, trauma, or a 'cold,' the eye will suddenly become inflamed. That such minor ailments are only the exciting, and not the predisposing cause, is shown by the fact that the eye remains inflamed long after they have ceased to act, while it recovers rapidly with the cleaning of the septic area. This is particularly noticeable after operations. Patients whose mouths are septic frequently take a long time to recover from such an operation as a cataract extraction. If, however, the septic focus is removed, the eye will recover rapidly."

He considers the argument that, whereas very many people have very septic mouths, very few have inflamed eyes, and that if there

were any real connection between septic teeth and inflamed eyes many more eyes ought to be inflamed, as of little force, adding that whereas many men get gonorrhoea, very few get gonorrhoeal arthritis. He suggests that senility of itself and myopia of itself do not cause chorioiditis. The senile arteritis and the stretching of the chorioid in myopia each tend to reduce the resistance of the chorioidal tissues; he thinks that these are really cases of septic chorioiditis occurring in eyes that are in a weakened state, in support of which contention he points out how very much less chorioiditis one sees in private patients with myopia than in hospital cases, and that senile central chorioiditis is most frequently found in patients of the workhouse type.

In conclusion the writer says that it is in no way desired to suggest that it is necessary in every case to find out and treat a septic focus to cure the patient. Many cases of iritis and the like recover under the influence of ordinary treatment and the action of drugs, but such cases frequently recur unless the septic focus is treated. In cases of chorioiditis it is necessary to treat the cause early in order to obtain any great recovery of vision. "The object of this paper, and of the analysis of cases of which it chiefly consists, is to bring out the relationship of the patient's 'general condition' to eye disease. Absolute proof that any one case recovered because one type of treatment was employed is impossible, and if my contention were based upon but two or three cases that had recovered as the result of treating (or removing) the supposed septic cause, I should base no argument upon it. It is the fact that no fewer than 176 cases have been subjected to careful analysis, which emboldens me to maintain the views here expressed. I hold that these eye conditions are often septic in origin and not due to anaemia, idiopathic tendencies, rheumatism, or the gouty diathesis." C. H. M.

Unusual Duration of Mental Symptoms in a Case of Atropine Poisoning.—Burr, Chas. W., Philadelphia (*Arch. Ophth.*, March, 1913, XLII, 136), reports a case of atropine poisoning in which the mental symptoms continued for a period of six weeks. The patient, aged 52 years, had been using a standard atropine solution, for iritis, for nine weeks. The day previous to admission to the hospital she had suddenly become excited and hallucinatory, and had both visual and auditory hallucinations. The first twenty-four hours she had to be restrained physically, later she became quiet mentally, but the hallucinations continued. She had neither convulsions nor coma.

The author believes it was a case of pure atropine poisoning, without any other contributing factor. W. R. M.

Eye Troubles Caused by the Use of Hair Dyes.—Fernandez, Juan Santos, Havana, Cuba (*Arch. Ophth.*, January, 1913, XLII, 7), discusses the various forms of hair dyes that are used, refers to various forms of eye involvement that have been caused by the use of such dyes, and draws the following conclusions:

"1. All hair dyes in use at the present time are more or less toxic in effect, and may give rise, under certain circumstances, to general and local eye troubles.

"2. The injurious effects experienced are of two classes, inflammatory and toxic, although both may be present at the same time. The trouble may be only ocular in character, or it may affect the general system as well as the eyes from the start.

"3. The dyes which do the most harm are those containing aniline derivatives. As they are very easily prepared, these are the dyes most generally used.

"4. Fortunately as the aniline derivatives are powerful colorants a smaller quantity of the dye is necessary to produce the desired results, and there is, therefore, less danger to the eyes and the general health." W. R. M.

On Ocular Changes by Ethylene Dichlorid ($C_2H_4Cl_2$, Dutch Liquid).—Erdmann, P., Hannover (*From the eye clinic of Prof. A. Peters in the University of Rostock. Arch. f. Aug.*, 73, p. 63), studied the effects of inhalation and subcutaneous injection of ethylene dichlorid on the eyes of dogs, rabbits and guinea pigs, and reports his experiments in detail, with the following results: In the dog, not in the rabbit and guinea pig, a parenchymatous opacity of the cornea develops from edema of the ground substance of the cornea in consequence of a lesion of the endothelium. In the majority of cases the cornea clears up from the periphery towards the center after regeneration of the swelled or detached endothelium. In the majority of cases the cornea clears up from the periphery towards the center after regeneration of the swelled or detached endothelium. In insufficient regeneration, especially in older animals, the opacity may stay for months or permanently. After clearing of the cornea renewed inhalations may again produce an opacity. A tolerance to the poison has not been observed. The pathological process consists in simple edema, never complicated by inflammatory infiltration or vascularization. The epithelium also suffers an edematous imbibition, indicated by expan-

sion of the intercellular spaces and the formation of vacuoles, but it is never elevated in form of vescicles. Tension is not unfrequently lowered. In longer duration the spongy parenchyma may present larger lacunae filled with fluid and detached, partly necrossed, lamellae. After transient edema complete restitution may occur. Chronic edema may lead to immigration of pigment into the epithelium from the limbus and to the formation of a subepithelial nuclear fibrillar tissue, causing, with the irregular arrangement of the fixed cells and the undulary course of the lamellae, the remaining opacity of the cornea after subsidence of the edema. The edematous cornea by yielding to the intraocular pressure may assume a greater curvature.

The parenchymatous opacity of the cornea, produced by the absorption of ethylene dichlorid, resembles the edematous opacity following direct mechanical or chemical lesions of the endothelium fro mthe anterior chamber. It is also similar to certain, not inflammatory, congenital opacities of the cornea in man, which are mainly due to swelling of the parenchyma in defects of Descemet's membrane or permeability of the endothelium. In some cases a deleterious influence on the epithelium of the lens capsule was apparent by the development of blister cells at the equator. Hyperemia and formations of blisters on the ciliary processes were ascertained as consequence of the passage of the poison from the circulation into the aqueous.

Injection of ethylene dichlorid into the anterior chamber produced intense local inflammatory changes. Vapors of ethylene dichlorid striking the eye directly cause intense inflammations and a lesion of the cornea with shrinking, which by longer action may extend to the endothelium and may be followed by an edematous imbibition of the damaged parenchyma. Erosions developing on the edematous cornea in form of streaks or areas heal normally. If the edema spreads to the epithelium a single instillation of fluorescein stains the whole thickness of the edematous parenchyma diffusely green.

Ethylene dichlorid is ophthalmologically of great interest, as it enables us to produce in the dog a lesion of the corneal endothelium with subsequent edematous opacity of the cornea by absorption, without essential damage to the other parts of the eye. Two plates illustrate the histological changes. C. Z.

Biochemical Changes in the Vitreous in Acute Intoxications by Methyl Alcohol and Toxipeptides.—Grignolo, F. (*From the eye clinic in the University of Genna. Klin. Mon. f.*

Aug., 51, I, February, 1913, p. 157). Intoxications by toxipeptides, i. e. products of disintegration of albumen, e. g. by pepton, the anaphylactic shock, cholera, intoxication by meat, botulism, may occur under very acute symptoms and be confounded with intoxications of other kinds, e. g. by methyl alcohol. Segalo showed that both groups of intoxications can be sharply distinguished by the biochemical conditions of the serum. G. examined the aqueous of dogs intoxicated by methyl alcohol and pepton (Witte), and found that, while in intoxication by pepton the osmotic pressure and the concentration of the ions of hydrogen are not changed, the osmotic pressure in intoxication by methyl alcohol is extraordinarily increased. It shows that the active substances in pepton intoxication are not diffusible to the eye, whereas those of intoxications by methyl alcohol are very diffusible. This is probably due to a certain selective capability of the epithelia of the ciliary body.

C. Z.

How Can Solutions of Eserin Be Prevented From Turning Red?—Woelfflin, Ernst, Basel (*Klin. Mon. f. Aug.*, 51, II, March, 1913, p. 349), reports his experiments from which he reached the following conclusions: A minimal amount of alkaline suffices to transform eserin into rubreserin, which in neutral solution is constant, in alkaline solution is converted into physostigmin blue. Solutions of salicylate or sulfate of eserin turn red in consequence of the alkaline contents of the glass, supported by the minimal percentage of alkaline of distilled water and the access of light and air. Therefore a glass ought to be used which is as much as possible free from alkaline, under exclusion of light. In this respect the glass of Schott, especially the fiolax glass, is preferable to the quartz glass, or the bottle must be given a coat of paraffin, or the eserin solution be kept in a metal bottle, e. g. of zinc.

C. Z.

TRACHOMA.

Trachoma and Its Surgical Treatment.—Fox, L. Webster, Philadelphia, Pa. (*Ophth. Record*, December, 1912). The author reviews the history of this disease. Fox describes the Grattage operation. He uses the Darier forceps and three-bladed scarificator and the granular tissue is scrubbed with a toothbrush which has been steeped in a corrosive sublimate (1-100) solution just before being used. Immediately after scrubbing the part is washed with a solution of the same strength. An antiphlogistic lotion is applied

over the lids in addition to cold compresses day and night. The eyelid everter, an instrument devised by the author, will enable the surgeon to expose the retrotarsal fold of the upper cul-de-sac with perfect ease. G. I. H.

A Brochure on Trachoma.—White, Daniel W., and Treibly, Charles E. (*Ophth. Record,* May, 1912). The authors submit their personal experience amongst over 100,000 Indians of the United States. A conservative estimtae of the number of known cases of trachoma amongst the Indians of Oklahoma could safely be placed at 60,000 to 70,000, or about 60 to 70 per cent of the entire population (Indian) of the state. It can also be safely estimated that from 60 to 80 per cent of the population (Indian) of the United States have trachoma. The trachoma bodies of Prozawek have been found in trachoma, and according to the authors in most parts of the West these bodies are considered one of the most useful aids in diagnosis. The medicinal treatment is of doubtful value to the patient.

The authors' operative procedure in cases where they found hypertrophy with superficial follicles was to use sandpaper alone. In hypertrophy with deep follicular formation sandpaper and forceps are employed. In marked hypertrophy either sandpaper or the light application of Knapp's forceps showed excellent results. In cases showing superficial follicular formation not accompanied by hypertrophy, sandpaper proves of great value. The forceps have not proved beneficial in cases of hard follicular formation, and in these instances sandpaper has proven its efficiency. In cases where the lids are rough granular, just beginning the cicotricial stage, sandpaper and the Kuhnt forceps or rasp has been employed with good results. White's Silica Trachoma Rasps (sand or orange wood sticks) are made in five different shapes and angles, so that every portion of the eyelid can be reached. They are used only once and then discarded, thus preventing the danger of reinfection.

The authors still have another operation—the palpebral conjunctiva without the tarsus can be removed or vice versa, but if they want to eliminate the trachomatous tissue, both are removed. G. I. H.

To the Question as to the Diagnostic Value of Chlamydozoa Prowazek-Halberstaedter in Trachoma.—Isabolinsky, M., and Spassky, W. (*From the bacteriological institute at Smolensk. Zeit. f. Aug.,* 29, February, 1913, p. 109), give a brief review of the incident literature and report their own investiga-

tions on 200 cases of the eye department of the Gouvernement Hospital at Smolensk. Out of these 11 were forms of acute, 93 chronic, trachoma, 96 other inflammations of the conjunctiva, 1 conjunctiva of a rabbit and 5 cases of blennorrhoic vaginal secretion, of which one contained gonococci. Scrapings of the conjunctiva, and the secretions in the blennorrhoic cases, were dried on slides, fixated for from 10 to 15 minutes in methyl alcohol and placed for from 20 to 24 hours in Giemsa solution. The nuclei of conjunctival cells were intensely pink, the protoplasm uniformly light blue. In acute trachoma the positive results were three times as much as the negative, while in chronic trachoma the negative results surpassed the positive results. Taking both together, 48 per cent were positive, 52 per cent negative.

In the not trachomatous cases the percentage of positive findings equaled that of the trachomatous. In some forms of conjunctivitis, acute, chronic and epidemic, the number of positive results was greater, which was the case only in acute trachoma. Twenty-three per cent of the cured cases were positive, 51 per cent of the not cured cases. Only in one preparation of normal human conjunctiva inclosures were found, the other eye showed chronic trachoma with pannus and corneal ulcer. In all other cases the result was negative. The investigations of the authors on about 500 preparations confirmed the presence of such inclosures in the epithelial cells, but they did not observe a course of development of these inclosures within the cells. The question as to the specificity of the inclosures for trachoma must be answered in the negative, or, as these inclosures are found in not trachomatous processes and in normal conjunctiva, it must be supposed that the inclosures in these cases do not elicit the specific process and thus also for trachoma "trachoma carriers" must be surmised. The question whether the inclosures are micro-organisms or the results of a reaction of the cell to irritation remains open. C. Z.

Investigations on Trachoma.—Czaplewski, Prof. (*From the bacteriological laboratory of the City of Coeln. Zeit. f. Aug.*, 29, February, 1913, p. 159, and March-April, 1913, p. 267), reports on his investigations on trachoma, made in 1896 and 1897 at Koenigsberg on the abundant material of Dr. Heisrath, and recently at the City Eye Hospital at Coeln, where a large number of trachoma cases accumulated. By a new method which he described in the *Deutsche Medicinische Wochenschrift*, 1909, and *Centralblatt für Bacteriologie*, Vol. 47, C. found numerous forms which did not correspond to cells of the body, but had a far-reaching

resemblance to those observed in the most different infections by protozoa. For a better understanding he recapitulates some of the most important protozoa infections, particularly the course of development of the agents of the protozoic infectious diseases, which occurs in so-called "generating cycles." As paradigmas the amoeba coli, coccidium Schubeigi, proteosoma and malaria parasites are presented. From these generating cycles the great variety of forms becomes clear, which the infecting protozoon assumes in the course of infection, e. g. of amoeboids, gametes, gregarines, sporozoites, cysts, etc.

In his recent trachoma preparations he found in the secretions and in the follicles amoeboid forms, partly with formation of chromidia, and very large plasmodia with inclosures, flagellates, gametes, cysts, etc., i. e. a large number of well characterized peculiar formations, which could be objectively demonstrated by staining and microphotography. As the infections by protozoa take a cyclic course and different stages of the parasites correspond to different stages of the disease, one cannot expect to find in each case and in each preparation always the same, and simultaneously all, forms. C.'s object was to demonstrate and fixate a large number of the forms seen by him, by microphotography and to prove their dissimilarity to cells of the body and their similarity to types of protozoa.

In the second article C. gives a detailed description of his new method, which is a modification of the staining method of Nakanishi and essentially represents a vital polychromatic minimal staining with borax methylen blue. It was supplemented by the examination in the pending drop, which has the advantage that the cell formations are not damaged by pressure. This method also is very good for the study of mobility and of the eventual further development of the individual forms, because often the succession of the single forms can thereby be inferred. While his former investigations were made on the conjunctival secretions, obtained with capillary tubes, C. devoted in his recent researches his attention especially to the trachoma follicles. He examined with Leitz 1/12, eyepiece 4, at 1,000 diameters.

C. concluded that, if in a number of the vital preparations from the secretion and follicles of trachoma the observed forms were actually cysts and states of encystations, such formations corresponding to cysts must also be found in sections. For that purpose he used antiformin, which dissolves the tissue in microscopical sections. He describes in detail his findings by these methods and gives an objective picture of them on numerous microphotograms

on four plates. By his further investigations C. gradually came to the conviction that the forms seen by him are closest to the myzetozoa and perhaps occupy an intermediate place between these and the coccidia and myxosporidia, although they have some resemblance to the gregarines.

For a long time trachoma has been considered a contagious disease, caused by a kind of protozoa. These were recently supposed to be chlamydozoa, infinitely small forms, barely visible with the best microscopes. If C.'s interpretation of his observations is correct, it would be a parasite of partly very large forms, besides which also the before mentioned finest forms would occur as initial stages. The parasite at first enters the epithelium, through which he migrates and forms more or less superficially by its accumulations the bulk of the follicles. Thus trachoma in a natural way would come into a certain parallelism to amoeba dysentery, in which in a similar fashion accumulations of dysentery amoebae in foci takes place in the mucous membrane and submucous layer. Amoeba dysentery is known to be propagated by contaminated drinking and bathing water. Trachoma occurs endemically chiefly in low lands among unclean populations. Hence C. infers whether it would not be possible that in trachoma not only contact infection from person to person by common towels, etc., but also infected water plays a part. Certain epidemics of trachoma-like diseases are attributed to the use of certain swimming baths. May not in nature, C. asks, similar modes of contagion occur as in amoeba dysentery by protozoa, which under favorable conditions may live and multiply in polluted waters and remain infectious. C. Z.

TUMORS.

Removal of a Spindle-Cell Sarcoma From the Right Orbit. Recovery With Intact Ocular Apparatus.—Allport, Frank, Chicago, Ill. (*Ophth. Record,* July, 1912). Three tumors all encapsulated; the capsule in each was removed unbroken. Artery forceps were not used, as the bleeding was not profuse, and was reasonably well controlled by adrenalin. The sides of the wound were held apart by long, smooth hand-retractors. One of the retractors also held the eye away from the field of operation. Patient dismissed in six days, at which time her vision was 20/15 and her fundus was normal. G. I. H.

Report of a Case of Melanotic Sarcoma of the Ciliary Body.—Aynesworth, Horace T., Waco, Texas (*Ophth. Record,* October, 1912). Patient, age 38, was operated upon in 1911 and

the eye removed. The specimen shows a mixed round and spindle cell sarcoma, richly pigmented, with the round cells predominating. The tumor is also very vascular, conditions that certainly do not offer a very flattering prognosis. G. I. H.

Short Clinical Accounts, With Microscopic Demonstrations of Two Cases of Tumor of the Optic Nerve.—Sattler, Robert, Cincinnati (*Arch. Ophth.*, January, 1913, XLII, 25), reports two cases of tumor of the optic nerve. Case I was a fibro-sarcoma. The tumor was first removed by resecting the outer wall of the orbit (Kroenlein). Five days later it was necessary to enucleate the eyeball. Examination showed the neoplasm to be a fibro-sarcoma apparently having its origin in the dura mater. Two years after the operation the health of the patient was favorable.

Case II was an intra-dural fibro-sarcoma of the optic nerve occurring in a boy aged four years. A progressive exophthalmos, of five months' duration, was present with optic atrophy. The tumor was removed as an encapsulated mass. Later the eye was enucleated. Fourteen months later the patient was in good health.

The pathological reports are given and the article is illustrated. W. R. M.

Concerning Two Cases of Dermoid at the Sclerocorneal Margin.—Chance, Burton, Philadelphia. These two cases were under observation at the same time at Wills Hospital. The first case was under the care of Dr. Schwenk and came for glasses. He was a Russian boy of 15 years. A tumor occupying an area of 3x7 mm. on the sclera and cornea was present and had been since birth, but was regarded as a birth mark by his parents and therefore of no consequence. It was of a pearl-gray color and protruded between the closed lids. A few stiff hairs projected from its summit. It was dissected from the sclera and cornea, to which it was intimately attached, and the conjunctiva sewed over the raw area. The other case was in a 13-year-old Italian girl and was in the same position, lower temporal quadrant, on the cornea and sclera. It was not as large as the tumor in the former case, but was more pink, and the parents feared it was growing and might be malignant. It was more on the sclera than cornea. The same method of removal was carried out in both cases. Healing was uneventful. The subsequent examination of the tumors by Dr. Brinkerhoff disclosed many characteristics in common, namely fibroelastic tissue, chiefly with a covering of laminated squanous epithelium. Fat cells, sebacious glands and hair follicles with their retained shafts

were common to each. In the case of the girl there were epithelial islands and much pigment, which indicated that pathologic activity was going on. M. B.

Lymphangioma of the Ocular Conjunctiva Presenting the Aspect of Hemangioma.—Erb, A., Lugano (*Zeit. f. Aug.*, 29, February, 1913, p. 120). A boy, aged 10, developed soon after birth a flat, soft tumor at the right eyebrow, which gradually grew and spread over the sclera, in form of a gelatinous swelling. After a blow on the eye two weeks previously the white swelling suddenly became dark red. It was movable with the conjunctiva. For an exact diagnosis a piece was excised and examined at the pathological institute at Zürich, and found to be a hemato-lymphangioma. The epithelium of the conjunctiva was intact, the subconjunctival tissue was thickened and contained numerous cavities of different sizes, which were partly empty, partly filled with a homogeneous mass, coagulated lymph, some with blood, and were lined with endothelium. The septa consisted of fibers of nuclear connective tissue in which nodules of lymphatic tissue were inspersed, partly with fresh inflammatory infiltrations. Since on account of its extent a total extirpation of the tumor was out of the question, it was reduced by elecrolysis. When the patient returned after some time the eye was white and the whole ocular conjunctiva showed a markedly pale chemotic swelling. V with +cyl. 4.00 90% 5/15. Dionin produced an enormous swelling of the conjunctiva, which subsided after five days.

With regard to the etiology, E. adopts the explanation of Ribbert, who assumes processes of proliferation of conective tissue and lymphatic spaces lined with epithelium, starting from a tissue, which was separated during intra/- or extrauterine life. C. Z.

On Plasmoma of the Conjunctiva.—Rados, A. (*From the eye clinic of Prof. E. von Grósz in the University of Budapest. Zeit. f. Aug.*, 29, February, 1913, p. 125). In 1874 Waldeyer introduced the term plasma cells for certain cells of the connective tissue. von Marschalkó attributes their origin to the lymphocytes of the blood, which R. considers the most probable, especially if one includes the lymphocytes of any proveniency. Normally they occur in the bone marrow, spleen and lymphatic glands. Pascheff described in 1908 tumors of the conjunctiva, which consisted chiefly of plasma cells and are called plasmoma. The two cases reported by R. were characterized by lobular form and smooth surface, and were located in various portions of the conjunctiva, chiefly the

retrotarsal folds. Besides plasma cells they contained numerous polynuclear leucocytes and lymphocytes, which indicated their local inflammatory nature. This was confirmed in both cases, especially in the first, which showed trachoma in the cicatricial stage and pannus. The histological structure of the tumors is described in detail and illustrated. C. Z.

Fibro-Angioma of the Orbit.—Schirmer, Otto, New York City (*American Medicine,* March, 1913). The objective signs and the symptoms which led to a diagnosis of retrobulbar tumor are described. A temporary resection of the temporal orbital wall by the Kroenlein method was decided upon. A big flap formed of skin, muscle and bone were turned outward. A smooth, firm tumor attached by a small pedicle to the inner orbital wall was discovered and was detached and delivered in toto. A year later the scar was scarcely visible, the position of the eye normal, mobility nearly perfect and the sight normal. M. D. S.

A Case of Cerebello-Pontine Tumor, Diagnosed and Located Three Years Before Death.—Veasey, C. A., Spokane, Wash. (*Ophth. Record,* March, 1913). The author states: "We had first the symptoms of compression or of intracranial tumor, viz., choked discs, intense occipital headache, nausea, vomiting, vertigo and ataxia, and as symptoms of localization we have the lack of function of the right auditory nerve, early development of noises in the right ear, diminution, then failure of hearing on the right side, together with dizziness and vertigo. In addition we have involvement of the right facial nerve, the right sixth nerve, and the right fifth nerve, all, it will be observed, on the right side. A diagnosis was therefore made of a tumor in the right cerebello-pontine angle." G. I. H.

Peribulbar Implantation Cyst After Removal of Staphyloma of Cornea.—Samuels, Bernard, New York (*Arch. Ophth.,* January, 1913, XLII, 12), describes a case of subconjunctival cyst, occurring after removal of a corneal staphyloma. Three years after the removal of the staphyloma examination showed a cyst of the orbit occupying an area larger than the normal eyeball. Operation showed the cyst to be filled with a clear fluid and enclosing within its walls the shrunken eyeball. The cyst was an implantation cyst and had spread posteriorly to the optic nerve, invading the entire space of Tenon.

The microscopical findings are given and the article is illustrated. W. R. M.

VISION AND COLOR VISION.

Color Adaptation.—Edridge-Green, F. W. (*Proceedings of the Royal Society,* B, Vol. 86).

1. In color adaptation, the retino-cerebral apparatus appears to become less and less sensitive to the color corresponding to the dominant wave-length, and to set up a new system of differentiation.

2. When light of a composition differing from that of daylight is employed to illuminate objects, an immediate and unconscious estimation of the colors of these objects is made in relation to this light, the light employed being considered as white light.

3. No color is seen of which the physical basis is not present in the light employed.

4. When spectral regions are examined with a color-adapted eye, that of the dominant wave-length appears colorless, whilst those immediately on either side of it appear to be shifted higher and lower in the scale respectively.

5. There is immediate color adaptation, as well as color adaptation after a longer stimulation with the adapting light.

6. Colors which correspond to the dominant wave-length of an artificial light are with difficulty discriminated from white by this light.

7. Color adaptation may bring two colors below the threshold of discrimination, so that the two appear exactly alike, although by another kind of light a difference is plainly visible.

8. Color adaptation increases the perception of relative difference for colors other than the dominant.

9. The conscious judgment has very little effect in color adaptation.

10. Color adaptation greatly helps in the correct discrimination of colors and masks the effects of the very great physical differences which are found in different kinds of illumination.

11. Spectral yellow, after color adaptation to green, still appears yellow, and not red.

12. Color adaptation appears to produce its effects by subtraction of the dominant color sensation, and not by directly increasing the complementary. Spectral blue does not appear brighter after color adaptation to yellow. M. B.

Trichromic Vision and Anomalous Trichromatism.—Edridge-Green, F. W. (*Proceedings of the Royal Society,* B., Vol. 86, 1913).

1. Trichromic vision is not synonymous with anomalous trichromatism.

2. Many persons with otherwise normal color-perception make an anomalous equation.

3. Many color-blind persons (dichromics and trichromics) make an absolutely normal match with no greater mean deviation than the normal.

4. Color weakness is not characteristic of anomalous trichromatism, but of trichromic vision.

5. Anomalous trichromatism and color weakness are not synonymous.

6. A large mean deviation indicates color weakness.

7. Anomalous trichromatism appears to be due to an alteration in the normal relations of the response to the three colors (lights) used in the equation. If the eye be more or less sensitive to one of the components of the mixed color whilst the other has its normal effect, an anomolous equation will result. An anomalous equation will also result when the yellow is more allied to green or red than is normal. M. B.

VISUAL FIELD.

Hemianopsia of Luetic Origin, With Partial Recovery.—Bruner, William Evans, Cleveland, Ohio (*Ophth. Record*, September, 1912). Under mercury, potassium iodid or idalbin he has gradually improved, so the outer limits of the form field are normal in each eye and the blind area is practicaly the same as at the last visit or as the last chart above. The pupils are equal and respond to light. Ophthalmoscopic examination shows the central portion of the right nerve pale, but not so the left. The vessels are normal in size and the fundi perfectly normal in other respects. As it is now about 4½ years since the attack of hemianopsia, it is evident that the present scotomas will in every probability remain permanently. There has been absolutely no other indication whatever of any cerebral disease or disturbance of the nervous system. G. I. H.

Ring-Shaped Scotoma Developing From the Blind Spot (So-Called Bjerrum's Sign), in Cerebral Choked Disc.—von Szily, Aurel (*From the eye clinic of Prof. Th. Axenfeld in the University of Freiburg i. Br. Klin. Mon. f. Aug.*, 51, I, February, 1913, p. 196). A student, aged 25, was kicked on his head by a horse, while serving his military year. In December, 1911, he

came to the clinic complaining of haziness before his eyes and diplopia. The examination revealed bilateral choked disc without hemorrhages and paralysis of the left abducens. The patellar reflexes were abolished, there were slight tremor of hands and legs and slight disturbances of equilibrium. Wassermann was negative. A cerebellar tumor was diagnosed, and, as at first normal vision commenced to fail slightly, punctures of the corpus callosum were made and 150 ccm. fluid emptied, with improvement of the subjective feeling of the patient and a slight receding of the choked discs. While in the further course the blind spot in the left eye remained stationary, a ring-shaped scotoma developed in the right eye. The visual fields were examined with different methods, of which that of Bjerrum proved the most subtle.

von Sz. discusses the indications to decompressing operation and attributes the greatest importance to the observation of vision and the visual field. In this respect the paracentral scotoma arising from the blind spot with intact vision and relatively good contours of the visual field gains a special significance, as its progress may give occasion to an operation before the appearance of other symptoms. In S.'s case the ring-shaped scotoma indicated the advisability of an operation, which will be performed. C. Z.

Book Reviews

Ophthalmoscopic Diagnosis.—Adam, C. Translated by Foster, Matthias Lanckton, with 86 colored pictures on 48 plates and 18 illustrations in the text. The Medical Art Agency, Herald Square Bldg., 141 West 36th St., N. Y. City. Rebman Company. Price, $6.00 net.

I wish to commend most heartily this work on "Ophthalmoscopic Diagnosis" by Adam as a most interesting and valuable addition to the library of the ophthalmologist. The 86 plates therein contained are very well reproduced, in fact are among the best productions of the printers' and engravers' art that have been made by the three or five color photo tint processes. The original drawings must have been most exquisite and bear the mark of individuality. The author has taken the ophthalmoscopic findings as a basis for classification of the text and of the drawings, special attention being given to those diseases of the eye which are related to general diseases. The language of the text is exceedingly simple and has been well translated by Matthias Lanckton Foster. The reviewer is somewhat surprised at the price of the book, it only being six dollars, knowing as he does the great expense of reproducing colored drawings by any process. The printing is as good as the text.

H. V. Würdemann.

Elliot, R. H., Madras.—Sclero-Corneal Trephining in the Operative Treatment of Glaucoma. London, George Pulman & Sons, Thayer St., Manchester Sq. W. Limited. Price, 7 shillings 6 pence net.

The number of articles on glaucoma appearing during the last few months is greater than any relating to other pathologic conditions; not because glaucoma is now prevalent or more serious than it has been, but the interest in it has reached a new impetus, both in diagnosis and in treatment. The tonometer of Schiötz has given exactness to the essential fact of glaucoma, that of intraocular tension, and a number of new operations have been devised which seem at this time to be in a fair way to displace the old standard of iridectomy which since the time of von Graefe has been our ultimate resort to combat this dread disease.

The scope of the book is revealed by the chapter headings: Indications for Sclero-corneal Trephining; Preparations for the Operation; Modifications of Operative Technique Suggested by Other Surgeons; Complications Which May Be Met With During the Operation; After Management of the Patients and Treatment of

Complications; The Diagnosis of Glaucoma in Southern India; Method of Compiling Statistics, and the Results of Trephining as Judged by Statistics of Returned Cases.

In addition to these chapters Elliot has included an historical chapter made up of papers by Stephenson on the Trephine in the Treatment of Glaucoma, and by Ballantyne on the Newer Operations for Glaucoma, and a final chapter by E. Temple Smith on the Site of Trephining for Glaucoma.

This gives the reader a comprehensive view of the practical advances recently made in the treatment of glaucoma. The operations of Querenghi, Bjerrum, Abadie, Herbert, Bettremieux and Verhoeff are all described. Cyclodialysis, the Lagrange operation and the trephining of Fergus receive careful attention.

The modifications of technique suggested by various authors are thoroughly discussed by Elliot, the book is well written, the illustrations really illustrate and the index is complete. The book will certainly meet with a large sale, not only because of the reputation of the author and its own instructiveness, but also by reason of the appropriate time of its publication, when every ophthalmic surgeon is interested. H. V. Würdemann.

Eye-Strain in Everyday Practice.—Stephenson, Sydney. The Ophthalmoscope Press, 24-26 Thayer St., W. London. Price 3 shillings 6 pence net.

It is with a great deal of interest that the reviewer has read this little book, bringing as it does the facts of practical refraction up to the present time. The volume consists of addresses and essays given before general medical gatherings or published in general medical journals, and thus is particularly adapted for general reading. The language is clear and not technical and does not go into the methods of fitting glasses or the pathological anatomy of refraction, but rather is a book on diagnosis of eye strain and ocular headaches, and as such should be welcomed by the general practitioner.

One chapter deals with "Ocular headaches," one with "Migraine in children," one on "Habit-spasm and eye-strain" and another "On cases of eye-strain simulating grave organic diseases of the central nervous system."

The reading is made interesting by brief and well chosen case histories. H. V. Würdemann.

Surgery of the Eye.—Ervin Torok and Gerald H. Grout, with 509 original illustrations, 101 in colors, and 2 colored plates. Lea & Febiger, Philadelphia and New York, 1913. Price . . . .

This book bears the hall mark of personal experience, which the authors state was fifteen years in Budapest, Berlin and New York. It is a safe and thoroughly practical work on the surgery of the eye, although many operations and methods that are in common use by other surgeons are not discussed and are probably intentionally omitted. Among these are the operation for expression of cataract, the "Pagenstecher-Smith" operation, which has received no mention. Likewise the various complications that are met with in this operation have been largely omitted.

On reading its pages the reviewer gains the impression that the authors have simplified their descriptions a little too much or that their experience has been either routinely successful or most happy in the exception of complicated cases as ordinarily have fallen to their lot. But very few cases will be found to pursue the routine course as described in this book.

I would like to know why the method of operating in front of the patient—the ambidextrous method—which is routinely followed more often in America than in Europe, particularly in England, is called the "European method," and that of standing behind the patient, which is largely the custom of those ophthalmic surgeons who have received their operative training in England, is called the "American method." Because so many of the New York and Philadelphia surgeons stand behind the head of the patient to operate, there is no reason why that method should be termed "American." This is a large country and there are at least two thousand eye surgeons who prefer to face the patient and thereby be in a better position to watch and immediately control any untoward movement.

The illustrations are very good and very well printed, new and original and of great value in the elucidation of the text. The book is heartily recommended for the library of the Ophthalmologist.

H. V. Würdemann.

Ophthalmic Semiology and Diagnosis; an International System of Ophthalmic Practice.—Beard, Chas. H.—With thirteen colored plates and seventy-one figures in the text. Edited by Walter L. Pyle. P. Blakiston's Son & Co., 1012 Walnut St., Philadelphia, 1913. Price, $4.00 net.

This book merits—as do all of the six volumes of the International System of Ophthalmic Practice—a place not only in the

library but on the desk of all active ophthalmic practitioners, not only for reference, but for constant reading. The language is delightfully personal, the author talks directly to the reader. The illustrations are very good and have lost but little in reproduction from the originals, many of which have been personally examined by the reviewer. They have been painted directly from the human fundus and are therefore individualistic and thus far superior to some of the oft-copied illustrations of some other text books. I wish every oculist could read, inwardly digest and apply in practice not only the whole of the book, but particularly the first eight pages, which deal with the introduction, the interrogatory, personal history, hereditary antecedents, consanguinity, familial affections, errors of assumption and error of precipitation—all in general diagnosis. The author then goes on with his descriptions, in anatomic order, of the anterior part of the eye and its adnexa, taking up one hundred and forty-six pages, the balance of the book to page 394 being given to the fundus oculi. Of particular interest are those descriptions dealing with changes in the blood vessels, which are well described up to the present knowledge of these conditions.

The absence of quotations makes the book very smooth reading. It is closed by an index, making the contents four hundred pages, well printed and bound. H. V. Würdemann.

Text Book of Ophthalmology.—Roemer, Paul. Translated by **Foster, Matthias Lanckton;** 186 illustrations in the text and 13 colored plates. **Rebman Company, 1123 Broadway, New York. Price $7.50 net.**

This is one of the few treatises upon the whole subject of diseases of the eye which has been written by the author directly from lectures and reproduced in the style which he had been accustomed to use. Here and there will be found side remarks and discursions from the direct subject, all of which, however, are of great value in connection with what the author is describing. By this handling of the subject Roemer tries to impress upon the student the definite clinical picture of a disease and then points out variations with powerful vividness and force, which in the translation by Dr. Foster, as well as in the original German, renders the pen picture so lifelike that they seem to bring the individual patients who form the texts of clinical lectures distinctly before the reader.

The author is an enthusiast in the specific treatment of diseases, more particularly those caused by the various pus producing germs; yet while this form of treatment is not at this time generally accepted or proven efficacious, still the trend of modern medicine is

this way, and it may be that some forms of serum medication will be so firmly established as to warrant some of the claims made by this author. More particularly is he enthusiastic upon the treatment of suppurative keratitis by pneumococcus serum, or rather the injection of emulsions of killed cocci by the hypodermatic route and by instillation of the fluid directly into the eye. The effectiveness of this form of treatment is yet *sub judice* and there have been very many failures in the hands of others. Be this as it may, some time a specific form of treatment will be discovered. Of particular interest is the author's discussion of the serum diagnosis and therapy of syphilis and tuberculosis, which is quite up to date. The illustrations are all new, but are not well printed—a pity, because many of the cuts are of exceptional value. The author, too, is somewhat provincial, which fact is alluded to by the translator, and therefore the procedures and forms of treatment described by him are thoroughly German.

A very complete index with a bibliography, in the latter of which few American names appear, completes the book, 896 pages.

Certainly it is of value, and we have to thank Dr. Foster for his most excellent translation and for placing this version of ophthalmic practice before the profession. H. V. Würdemann.

Transactions of the Seventeenth Annual Meeting of the American Academy of Ophthalmology and Oto-Laryngology, 1912.

This volume of 445 papers contains the addresses and essays read before the 1912 meeting at Niagara Falls, Ontario, August 20, 21, 22, 1912, there being twenty-three papers on Ophthalmology, twenty-six on Oto-Laryngology.

Of particular moment may be remarked the address of Prof. Elschnig, Prague, Austria, who explained his anatom theory of the paper of Derrick T. Vail being an Inquiry Into the Results of the Established Treatment of Detachment of the Retina and a New Theory. He had reports from two hundred ophthalmologists in regard to their experience in curing "non-traumatic" retinal detachment, the very large majority of whom stated that they "had never seen a cure by any manner of treatment."

His summary abstracts the paper as follows: 1. The established medical treatment of detached retina is a failure, because the etiology of the trouble is not recognized. 2. The surgical treatment is not founded on scientific principles and is therefore brutal. 3. Detachment of the retina is not a disease, it is a symptom. 4. The disease of which detachment is a symptom is paralysis of

function of the ciliary processes, causing arrest of aqueous secretion within the eye. 5. The treatment should be the use of those measures and only those which have for their objects the re-establishment of the lost function of the ciliary processes.

The other papers contain nothing novel. That by F. Park Lewis, Conservation of Vision as a National Movement: its Origin and Purpose, that by Edw. Jackson, on the Study of Ophthalmology, and that by Linn Emerson on Ethical Problems, show the trend that modern special writing is taking in certain sociological aspects.

The papers of Oto-Laryngology section are not pertinent to Ophthalmology. All of these are technical and pertain directly to these subjects. H. V. Würdemann.

The Medical Annual, a Year Book of Treatment and Practitioner's Index. Published by John Wright & Sons Ltd., Bristol, Eng.; New York, E. B. Treat & Co.; Toronto, J. F. Hartz & Co.; Calcutta, Thacker, Spink & Co.; Melbourne, Sydney, Adelaide and Brisbane, G. Robertson & Co.

We are glad to welcome this indispensable work and to see that it maintains its accustomed high state of excellence. The references to advances in ophthalmic work are, as usual with this publication, favored with a large share of attention and the further benefit of several most beautifully executed colored plates and a large number of engravings. The ophthalmic section is supplied by Mr. Hugh Thompson and Mr. John Yearsley, as in past years. The article from the pen of the former on Glaucoma should be read by all, as it forms a valuable summary of the various theories at present in vogue as to etiology of the affection. Another valuable summary of the various causative factors is that on Miners' Nystagmus (also from the pen of Mr. Thompson). In this article he refers to Mr. Snell's theory, who considered it as a myopathic disease induced by overwork of particular muscles, which theory is not now generally held, becoming replaced by the "illumination cum debility" theory. Gower's view is that it is caused by disease in the equilibration center is also referred to. Probably the latter cause produces the nystagmus which is met with in disease of the nervous system, and that met with in miners has the other cause, viz: "poorness of illumination." We cordially recommend the work to both general and special practitioners. A. A. Bradburne.

Geometrical Optics.—Percival, Archibald Stanley, M. A., M. B., B. C. Cantab. Senior Surgeon Northumberland and Durham Eye Infirmary. Author of "Optics," "Practical Integration," "Prescribing of Spectacles." Longmans, Green & Co., London, 1913. Price $1.50 net.

This book is intended for students, but it contains all the optics required by an ophthalmologist.

The contents is divided into six chapters: (1) Illumination—Pinholes—Shadows. (2) Reflection at Plane Surfaces. (3) Reflection at a Spherical Surface. (4) Refraction at Plane Surfaces. (5) Refraction at a Spherical Surface, (6) Lenses.

This book is a practical treatise on Optics. The printing is good and the weight of the book apepals to me, as do most of the English editions. Why should we not use the same quality of paper? I am sure it would add to our enjoyment in handling and reading the book. G. I. Hogue.

The Pituitary Body and Its Disorders. Clinical States Produced by Disorders of the Hypophysis Cerebri.—Cushing, Harvey, M. D., Associate Professor of Surgery the Johns Hopkins University, Professor of Surgery (Elect) Harvard University. An Amplification of the Harvey Lecture for December, 1910. J. B. Lippincott Co., Philadelphia, 1913. $4.00.

This important work by such high authority deserves great praise and will be of inestimable worth to the scientific ophthalmologist. The first part deals with the anatomy, pathology and chemistry of the pituitary body. Part two deals with the clinical manifestations of disordered function. Part three deals with incidence, symtomatology and treatment.

Cushing bases this work on the study of 50 cases. From the frequent direct implication of the optic nerves by the glandular enlargement, the ophthalmologist has often been the first to recognize these maladies, according to the author. Much can be done for the unfortunate victim of pituitary diseases and it is of utmost importance to recognize the existence of this disease. The author cites in the bibliography 256 articles. The illustrations, 319 in number, are excellent and the visual fields presented are of great interest. G. I. Hogue.

The Accessory Sinuses of the Nose.—Skillern, Ross Hall, M. D., Professor of Laryngology, Medico-Chirurgical College! Laryngologist to the Rush Hospital; Fellow of the American Laryngological, Rhinological and Otological Society; Fellow of the New York Academy of Medicine; Member of the Society of German Laryngologists, etc. J. B. Lippincott Co., Philadelphia. Price, $5.00.

This is a valuable book to the ophthalmologist and in the opin-

ion of the reviewer is the only complete general text book on this subject in the English language.

The contents is divided into the following parts: (1) General Considerations, (2) Maxillary Sinus, (3) Frontal Sinus, (4) Ethmoid Labyrinth, (5) Sphenoid Sinus, and in a methodical and practical manner the author takes up the anatomy, pathology, aetiology, symptoms, diagnosis and treatment of the various sinuses.

The 252 illustrations add a great deal to the interest and understanding of the subject. The author affirms in his conclusions that the sinuses, under normal conditions, do not harbor micro-organisms, being able to render inert and expel the germs. Headache resulting from sinus affections is, according to Skillern, one of the commonest and at the same time least understood of all the symptoms associated with the disease. The author states that the cause of the headache depends upon one or more of several conditions: (a) Swelling of the mucosa with pressure or irritation of the nerves. (b) First contact of the swollen mucosa. (c) Negative pressure in the sinus. (d) Stasis following obstruction of the drainage passages. (e) Ulceration of mucosa with involvement of the nerves. (f) Reabsorption of toxins formed within the sinus. (g) Any condition which causes active congestion of the cranial circulation (acute exacerbation of a chronic inflammation, overindulgence in alcohol and tobacco, etc.). (h) Disturbances in the blood and lymph circulation at the base of the skull. The experience of the author would indicate that pressure on the septum from hypertrophies, which so often coexist with sinus inflammations, is one of the main causes of persistent headache associated with the disease.

The author does not place much faith in the transillumination of the sinuses and demands other evidence before performing a radical operation.

The Roentgen Ray in diseases of the frontal, anterior ethmoid and maxillary sinuses and sometimes in diseases of the sphenoid and posterior ethmoid are of great value in the diagnosis, and the plates are presented.

No up-to-date ophthalmologist can afford to be without a copy of this book.

G. I. Hogue.

Transactions of the Thirty-Seventh Congress of the Ophthalmological Society. Heidelberg, 1912. Edited by A. Wagenmann, Heidelberg; 431 pages with 15 plates and 29 illustrations in the text. Wiesbaden. J. F. Bergmann, 1913. 16 Mark, $4.00.

Professor E. Fuchs, Wien, opened the meeting August 3, 1912. Dr. Martin Bartels, Strassburg, received the von Graefe prize for his work in von Graefe's *Archiv für Ophthalmologie,* 1910, Vol. 76, p. I, "On the regulation of the position of the eyes by the ear apparatus."

After the election of J. B. Lawford as chairman of the first scientific meeting the following addresses were made:

Pfalz, Düsseldorf: On the Duration and Kind of Optical Changes of Cicatricial Opacities of the Cornea, with the resumé: 1. The density of an opacity of the cornea, as appearing in incident light, is unreliable and cannot be utilized for estimation of the functional disturbance. The greater or lesser density merely diminishes by absorption and reflexion of the incident light waves the differential treshold of the light sense of the retina. The retinal image lacks more or less light.

2. The disturbances of the contours of the retinal image depend only upon the greater or lesser irregular curvatures of the corneal surface. Therefore the keratoscopic picture gives the most reliable indication of the degree of function in any kind of opacities of the cornea.

3. Traumatic opacities of the cornea give, as far as the corneal tissue alone participates in the formation of the scar, a good prognosis as to optical conditions. The time of possible improvement extends over 12 years. The change of curvature in dyscrasic affections of the cornea of long duration, especially the scrofulous, remains optically poor.

Lenz, G., Breslau: To the Doctrine of the Center of the Color Sense (*From the eye clinic of Prof. W. Uhthoff*), reports two cases with complete achromatopsia of the left halves and the upper quadrant of the right halves of the visual fields with autopsies, from which he concludes: 1. There is no anatomical isolated special center for the color sense. 2. This is dependent on the same area of the calcarina type as the senses of light and space. Most probably it is represented in the uppermost cortical layers.

Behr, F., Kiel: Contributions to the Anatomy and Pathogenesis of Choked Disc. An explanation for all cases of choked disc is still lacking. B. attributes this to the fact that the predominating majority of explanations is based on single anatomical

findings, which leave others unexplained. The second reason is that they all consider the choked disc dependent upon increased intracranial pressure, while in a great many forms the intracranial pressure is normal. The third reason is that the clinical manifestations, especially the typical concentric contraction of the visual field, are neglected. B. refers to the fold of the dura, which extends the length of the cerebral end of the optic canal. Below this he found in acute cases of choked disc an indentation of the surface of the nerve which corresponded to the free edge of this membrane. His observations led to the assumption of a firm occlusion at the optic foramen. Thus choked disc is brought about by a circular compression of the optic nerve which impedes the centripetal lymph current in the central vein. The consequent swelling of the disc projects into the vitreous. The circular pressure causes the typical peripheral defect of the visual field advancing towards the center. If the whole nervous tissue is destroyed by descendent degeneration and replaced by indifferent tissue, the secretion of lymph decreases and also the swelling of the disc, until it entirely subsides, and atrophy supervenes without prominence in spite of persistence of the original increase of intracranial pressure.

von Hippel, E., Halle: Further Communications on the Palliative Operations in Choked Disc, upholds by further observations his former view, that certain bilateral choked disc is an unconditional indication for surgical treatment. The operation must be performed while the functions are fully preserved and not be postponed to the beginning of visual disturbances. v. H. contends that today the question for discussion is which is the most expedient surgical method. Lumbar puncture is not indicated in probable tumors, especially of the posterior cranial fossa, on account of inefficiency and danger. He recommends it exclusively if the probability speaks for meningitis, especially serous, but also here more energetic methods are called for, if repeated lumbar punctures do not soon give relief. As before, he considers the decompressing trephining in two sittings as the correct procedure in cases which come at the right time. Of greatest importance is that narcosis can be dispensed with. Twenty cases are reported, in which puncture of the corpus callosum (Balkenstich) was performed, with the following conclusions: It has been proven beyond doubt that the Balkenstich can cure choked disc without atrophy and with preservation of functions. In some cases the Balkenstich may be more effectual than trephining. It is certain that the Balkenstich may be without result, even if the functions

are still normal. The view, also held by others, seems theoretically correct, viz. that in intense hydrops of the ventricles the methods of draining, i. e. also the Balkenstich, are indicated, in enlargement of the solid mass of the brain the trephining. Actual experience, however, leaves here certain doubts. If the condition of the functions do not require immediate maximal decompression, the Balkenstich, on account of its indisputable advantages, is the operation of choice, as it is capable of giving good information as to the condition of the ventricles. If immediate relief of pressure is urgent, v. H. recommends trephining as of greater effect. If the Balkenstich does not give decided improvement at the highest in from three to four weeks, v. H. absolutely advises trephining. Our experience is still insufficient for formulating distinct indications for both operations.

von Szily, Aurel, Freiburg: On the Primary Cause of the Malformation of the Eye, reports on his experiments in which he introduced salt, chlorid of calcium and magnesium, alcohol, ether and an emulsion of naphthalin, into hen's eggs at different stages of development. The malformations thus obtained were first macroscopically drawn, then cut into continuous paraffin series and reconstructed according to the method of Born. He found that, 1, all chemical substances used are more or less apt to produce malformations in the chick; 2, the effect is greatest at the time of the separation of medullar proton; 3, it is by no means possible to produce always the same malformations by certain chemicals; 4, similar malformations may occur experimentally by the most different measures. He then calls attention to the influence of hemorrhages and a too narrow amnion on the creation of malformations. v. S. considers it doubtful whether these observations furnish an embryological base for the origin of typical malformations. He could not confirm the assertion of Pagenstecher that the various malformations of the eye can be voluntarily produced by naphthalin feeding at certain periods of development. He also observed similar malformations of the lids like Pagenstecher, but deviates from his interpretation, as e. g. the colobomas in older fetuses were caused by amniotic adhesions.

Pagenstecher, H. E., Strassburg: The Causal Genesis of Ocular Malformations and Congenital Cataracts, supplements his experiments with naphthalin feeding, reported last year, by which he produced characteristic central, fusiform and posterior polar cataracts. The progeny of these animals in the second and

third generations had normal eyes, so that so far there is no evidence of the heredity of toxic cataracts and malformations.

Igersheimer, Jos., Halle, a. S., Experimental Researches on Syphilis of the Eye, injected mixed and clear cultures of spirochaete pallida into the common carotid and the eyeball, i. e. cornea, anterior chamber, vitreous and ciliary body, of rabbits. After injection into the carotid, typical changes of the fundus were noticed the next day, viz. numerous grayish foci with indistinct borders or white sharply defined foci, followed by immigration of pigment or marked chorioretinitic patches. Aside of these immediate changes, others developed after a certain latent period, which therefore can be the more readily ascribed to the action of spirochaetae, e. g. primary affections of the lids, primary parenchymatous keratitis without affection of the uveal tract, papulous iritis, inflammations of chorioid and retina, atrophy of the optic nerve. He rarely found spirochaete in the diseased eyes, because the eyes were fixated in modified solution of Zenker and formol.

Leber, A., Goettingen: On Tropical Eye Diseases, from observations on a journey to the South Sea and Dutch India.

Krusius, Franz, Berlin: Heredity, Facial Type and Anomable of Refraction, found as average 22.6% astigmatism of 1.2 D. Emmetropia and moderate hyperopia show a transition to myopia progressing with the years of development, especially in individuals with hereditary predisposition. Hereditary predisposition grows with the degree of ametropia and speaks for the certain importance of hereditary factors in the development of ametropia. In male individuals the motherly ascendency seems to have greater influence. A special method of stereoscopic composite photography shows certain differences between the types of hypermetropes, emmetropes and myopes, in the sense of increasing values of the proportions of the horizontal facial measures to the vertical for stereograms en face, and of the fronta-occipital length to the fronto-mental length for stereograms in profile.

SECOND SCIENTIFIC MEETING, AUGUST 4, 1912.

Chairman, A. Vossius, Giessen.

Franke, Hamburg: The Relations of Lymphocytosis to Injuries of the Eye and Sympathetic Ophthalmia. Lymphocytosis may be present in recent severe injuries of the eye which heal without irritation and in those with subsequent grave iridocyclitis. The same hematological aspect may be found in old perforating injuries of the cornea and severe contusions, which do not lead to sympathetic ophthalmia. The presence or absence of lymph-

acytosis in severe perforating injuries of the eye have no diagnostic or prognostic significance for the development of sympathetic ophthalmia.

von Rohr, M., Jena: On Astigmatic Glasses With Punctual Images. In the discussion W. Stock, Jena, demonstrates and recommends stereoscopic binocular loupe in form of spectacles for discission and removal of foreign bodies from the cornea. It magnifies to two diameters.

Gilbert, W., Muenchen: On Herpetic Disease of the Uveal Tract, was reviewed in the last number of *Ophthalmology.*

Fleischer, Tuebingen: On the Nature of Schnabel's Cavernae and Their Significance for the Development of Glaucomatous Excavation, found the cavernae almost regularly in secondary and primary glaucoma, if the excavation was not too far advanced. While Schnabel considered the cavernae as a primary affection of the optic nerve, specific for glaucoma, but independent of the increased ocular pressure, F.'s findings were such, that the cause for the formation of cavernae must be attributed to an accumulation of fluid, a lymph stasis, by disturbances of circulation from the abnormal conditions of tension. F. therefore considers the cavernae as a secondary process.

Wessely, K., Würzberg: Contributions to the Doctrine of Ocular Tension, reports on his experiments on the relation of ocular tension to the blood pressure, respectively shifting of blood in the body. After intravenous injections of amyl nitrite, caffein and antipyrin, a marked decrease of pressure in the carotid was noted. The peripheral vasodilatation was indicated by a considerable increase of ocular tension. The results so far obtained showed a complete concordance of the innervation of the intraocular and cerebral vessels.

A second series of experiments were devoted to the influence of the ocular movements on the ocular tension. Electrical excitation of the ocular nerves of the monkey at the cerebral base revealed an increase of ocular pressure of 5 mm. Hg. for the third, 2½ for the sixth and ½ for the fourth nerve. From his experiments for testing the tonometer of Schioetz W. recommends great caution in the estimation of the absolute registrations of the tonometer and sees a danger in making the diagnosis of glaucoma and advising operation merely from the absolute values of the tonometer, without other symptoms.

Heerfordt, C. F., Copenhagen: On the Valvular Action of the Vortex Sinoscleral Plate as Cause of So-Called In-

FLAMMATORY GLAUCOMA, examined the vortex veins at the entrance into the sclera in two eyes with inflammatory glaucoma and found in three venous branches the wall of the scleral canal bent into the canal so that it checked the passage of the blood like a valve. The mechanism is discussed in detail.

RUBEN, Heidelberg: ON INCREASE OF INTRAOCULAR TENSION BY SWELLING OF THE COLLOIDS OF THE TISSUE.

LOEHLEIN, W., Greifswald: EXAMINATIONS OF THE BLOOD IN GLAUCOMA PATIENTS. Examined 20 cases of primary glaucoma with regard to the amount of adrenalin in the blood and could not in any ascertain a positive reaction.

SCHNAUDIGEL, Frankfurt a. M.: ELLIOT'S TREPHINING IN GLAUCOMA. Reports such favorable results in 12 cases that he now performs only this operation in glaucoma, with the exception of cases of secondary glaucoma with occlusion of the pupil.

THIRD SCIENTIFIC MEETING, AUGUST 4, 1912.

CHAIRMAN, A. SIEGRIST, BERN.

KRAUSS W., Marburg: ON THE RELATIONS OF THE SYMPATHETIC NERVE TO THE VISUAL ORGAN, reports on his experiments in animals on the influence of excitation of the sympathetic nerve on the position of the eyeball, and its anatomical bases, with graphic demonstrations. They showed that the results cannot be applied from one species of animals to the other or man, as principal differences exist owing to different anatomical relations. The assumption of Landstroem, that the smooth muscles of the anterior segment of the orbit may create exophthalmus could not be confirmed. In all experiments excitation of the sympathetic nerve elicited: 1, dilatation of the pupil and palpebral fissure; 2, decrease of intraocular tension; 3, contraction of the vessels of the ear and the fundus of the eye; 4, increased secretion of tears; 5, erection of the hair on the same side of the head.

LANDOLT, E., Paris: TO THE OPERATIVE TREATMENT OF STRABISMUS, obtained complete fusion in a case of paralysis of the inferior rectus by advancing this muscle, at first with considerable overcorrection.

GRUNERT, Bremen: TO THE OPERATIVE TREATMENT OF KERATOCONUS, illustrates his method of operation on eight cases, in which he obtained good results.

SIEGRIST, A.: TO THE ETIOLOGY OF KERATOCONUS, reports nine cases in tabular form, in which very careful examinations of the blood revealed exquisite lymphocytosis and aeceleration of coagulation. This, with nervous disorders, dry skin, diminished secre-

tion of sweat, shedding of hair, etc., is characteristic of hypothyreoidism. Whether the hypothyreoidism is the cause of keratoconus or whether it gives only a predisposition and is elicited by other unknown elements is an open question.

Stock, W., Jena: On a New Kind of Utilization of the Contact Glasses Devised by Fick.

Dufour, M., Nancy: On Scintillating Scotoma, reports on his own attacks of scintillating scotoma and says he could determine when they were unilateral and when bilateral. The usual remedies did not help much.

Weiss, C. E., Schwäbisch-Gmünd: Amaurosis Fugax Through Spasms of the Retinal Vessels, observed in a man, aged 54, who for some time suffered from attacks of amaurosis, which sometimes occurred three times a day, the fundus during such an attack. He saw how first the arteries and then the veins of the optic nerve and the retina were entirely emptied, so that they appeared as whitish yellow bands. The disc and its surroundings were absolutely white. In the veins a sharply cut off blood column was visible at some distance from the disc. After half an hour the vessels were refilled, at first the small atypical cilioretinal and the veins, then slowly the larger arteries. Vision was gradually restored, but the central scotoma did not disappear until half an hour after the ophthalmoscopic picture had become normal. The patient related that he also has often spasms in his left hand as if it was asleep, which disappeared after warming the hand in his pocket, apparently symptoms of Raynaud's disease due to arteriosclerosis. The amaurotic attacks were rapidly stopped by taking from 3 to 5 drops of a 1% solution of nitroglycerin 2.00, in diluted spirit 20.00.

FOURTH SCIENTIFIC MEETING, AUGUST 5, 1912.

Chairman, Grunert, Bremen.

Stargardt, K., Kiel: To the Pathological Anatomy of Atrophy of the Optic Nerve in Tabes and Progressive Paralysis, reports on his anatomical examinations of further 10 cases, so that he has now a material of 24 cases. The changes speak against a toxin action in the retina. The inflammatory process starts with predilection in the intracranial portions of the optic nerve and is identical wth inflammatory processes not only in the cerebral cortex in paralysis and in the spinal chord in tabes, but also with those of other organs found in tabes and paralysis, e. g. aortitis, interstitial hepatitis and nephritis, smooth atrophy of the tongue, fibrous orchitis, inflammations of peripheral nerves and

tabic arthropathies. S. comprises all these processes with tabes and paralysis as "late syphilitic, not gummous" processes, caused by the local action of the pathogenic germs. They are not metasyphilitic, but real luetic diseases.

Brűckner, A., Berlin: On the Galvanic Irritability of the Eye.

Best, F., Dresden: The Examination of Stereoscopic Visual Acuity. It is practically possible to determine the stereoscopic visual acuity with almost the same accuracy as the visual acuity. B. found that in impaired vision of one eye in consequence of corneal opacities the stereoscopic vision decreases parallel to vision. Stereoscopic vision is generally more diminished by difference of refraction and congenital amblyopia. In high hypermetropia, myopia, and astigmatism, the stereoscopic visual acuity may be normal, but frequently is impaired.

Gebb, Greifswald: To the Therapy of Infection of the Eye by Diplobacilli, investigated the influence of 60 stains of Merck, soluble in water, on the diplobacillus in vitro. Thirty-six of these have a specific affinity to it, i. e. form with the diplobacillus a chemical combination, which abolishes its vitality. Then G. tested their influence on diplobacilli in the conjunctival sac of rabbits and had a mixture made of the most effectual, as far as it was chemically possible, by Grűbler at Leipzig. This mixture was similar in its action on diplobacilli and the mucous membrane to that of pyoktanin. After the experiments yielded very favorable results he applied it clinically in diplococcus infections with great success.

Birch-Hirschfeld, A., Leipzig: On Glaring of the Eye by the Sun. H.'s observations were published in the *Zeitschrift für Augenheilkunde* and reviewed in *Ophthalmology.*

Urno, Arisawa, Osaka, Japan, at present at Freiburg: On the Specific Properties of the Ocular Tissues.

Bayer, Heinrich, Freiburg: To the Pathology of Spring Catarrh, found that the good results obtained by an occlusive bandage can not be due to the exclusion of the light, as he had the same results if a watch glass or a piece of crystal was inserted in the occlusive bandage, but surmises that the contact with the atmosphere plays an essential part. Dark Hallauer glass, combined with a dark gray glass in automobile goggles, allowing the access of air, had no effect. B. observed in all recent cases the nodules, described and recognized as cysts by Trantas, as characteristic symptom of spring catarrh. Careful examinations of the blood

and secretion revealed a marked increase of lymphocytes and eosinophilia. The enormous abundance of eosinophilic cells in the secretion regularly disappeared with the abatement of the clinical symptoms.

Uhthoff, W., Breslau: To the Diagnostic Valuation of Unilateral Choked Disc, Respectively Optic Neuritis, and Unilateral Exophthalmus in Intracranial Diseases. This question is of great interest with regard to modern brain surgery. U. reports from literature and his own observations of undoubted cases, verified by operations or autopsies. In tumors of the brain unilateral choked disc occurred at the same side in 56%, at the opposite in 44%, deviating considerably from the statements of Horseley. Therefore we are not justified to diagnose from unilateral choked disc a homonymous seat of the tumor. Tumors of the convexity predominantly caused unilateral choked disc on the same and opposite sides. The basal tumors led three times as often to choked disc on the same side as on the contralateral side. In bilateral choked disc the more pronounced was on the same side in 73%, on the other in 27%. Unilateral neuritic or simple descending atrophy of the optic nerve, generally with intense amblyopia or amaurosis, combined with recent choked disc of the other eye, suggests a tumor on the side of the optic atrophy with direct compression of the optic nerve and spreading of the tumor to the other side. The diagnosis is especially corroborated by involvement of the olfactory nerve.

In cerebellar tumor unilateral choked disc is very rare, but in bilateral choked disc the tumor is found on the side of the more marked in the proportion 3:1. In concordance with Wilbrand and Saenger, U. considers the unilateral choked disc in brain tumor as a first stage, which, if the patient lives long enough, mostly is followed by disease of the second eye.

In basal aneurysms choked disc was found in 10%. It is very seldom unilateral, and if so, it seems chiefly caused by an aneurysm of the internal carotid through compression of the corresponding optic nerve.

In 13% of the cases of choked disc in cerebral abscesses the choked disc was on the same side in 4.5% of the cases, in 11% of the cases it was bilateral and in 4/5 more marked in the homolateral abscess. The longer duration and the outset of choked disc after the operation is not always an unfavorable prognostic sign.

In cerebellar abscess choked disc occurred in 23%, in 4% unilateral and in 1% unilaterally more marked. In all these cases

unilateral or unilaterally more intense choked disc, occurred at the side of cerebellar abscess.

In syphilis of the brain a unilateral choked disc generally indicates an intense gummous, respectively perineuritic, change of the stem of the optic nerve with basal lues of the brain. Choked disc was found in 14%, in 1% unilateral.

In hemorrhages and softening of the brain unilateral choked disc deserves no consideration, as positive changes of the discs in these disaeses are very rare.

Hemorrhagic pachymeningitis and hematoma of the dura mater are rare, but may occasionally lead to choked disc, although more frequently bilateral.

Occasionally unilateral optic neuritis may occur on the same side as diseases of the ear, without marked cerebral complications, but it has also been observed on the side of the healthy ear.

Otitic sinus thrombosis led to choked disc in about 18%, but indirectly by internal hydrocephalus, which explains that unilateral choked disc at the side of the otogenous thrombosis of the sinus is on the whole rare and of not much account for the diagnosis of the side of the intracranial process.

Optic neuritis, which was found in 24%, showed analogous relations.

In fractures of the cranial base descending atrophy of the optic nerve is twice as frequent as inflammatory changes of the disc. Unilateral changes of the optic nerve in fractures of the base as a rule present the aspect of descending atrophy and invariably indicate a fracture of the osseous optic canal.

Unilateral exophthalmus in tumors of the brain speaks for a direct spreading or formation of metastases in the orbit, and is generally not accompanied by more intense ocular palsies. This is occasionally of great diagnostic importance for deciding as to certain surgical measuers. Exophthalmus was observed in 3% of abscesses of the brain and 2% of the cerebellum. Most frequent is exophthalmus in septic thrombosis of the sinus (70%) complicated with intense inflammatory symptoms of the orbit and septic thrombosis of the ophthalmic vein. Otogenous thrombosis of the sinus much more rarely leads to exophthalmus (9%), and always with involvement of the cavernous sinus.

Kuffler, O., Giessen: To the Question of Immunity of the Vitreous.

Sattler, C. H., Giessen: On the Transplantation of Costal Cartilage into Tenon's Capsule after Enucleation, trans-

planted into Tenon's capsule of dogs and three patients slices of the costal cartilage, from 6 to 8 cm. long and from 1 to 2 cm. wide, which spontaneously curled, so that they could be easily shaped like the eyeball. In one case the prothesis could be permanently worn from the 12th day, and the movements of the stump were decidedly better than ordinarily after enucleation. A certain shrinkake occurred, but ½ or ¾ of a year later the stump had still the size of a hazelnut.

Verderame, Ph., Turin: Sensibility and Termination of the Nerves in the Cornea of the Newborn, found in 200 children, aged from 1 week to 2 years, that the normal sensibility of the cornea on touching its surface in general sets in in the fourth month and is regular between the sixth and tenth months. This difference in the sensibility of the cornea between the newborn and adult cannot be due to a difference in the structure of the nerves of the cornea, as the histological examinations of 15 very fresh corneae of prematurely born and newborn children up to the age of 1 year had about the same structure as those of adults. It must be attributed with great probability to the not fully developed function of the corresponding central nerve conduction.

Schneider, Rudolph, München: Experimental Investigations to the Serum Therapy of the Pneumococcus Infection of the Eye.

Siegrist, A., Bern: the Acquired Uveal Ectropium, reached the conclusion, that the acquired uveal ectropium is brought about by an active proliferation and migration of the pigment epithelia to the anterior surface of the iris. Like these the endothelia of the anterior surface of the iris proliferate. The disturbances of nutrition, subsequent to severe affections of the uvea give rise to these hypertrophic and hyperplastic processes.

Bielschowsky, A., Marburg: A new prism apparatus ("universal prism-apparatus"), manufactured by Carl Zeiss, Zena, for about $55.00.

The afternoon meeting on August 3d, 1912, was devoted to demonstrations.

As our brief review shows, the report contains an unusual array of elaborate scientific investigations and of clinical subjects of the greatest practical importance and will be read with intense interest and benefit. The external appearance, paper, print, and the numerous colored plates are of superior quality. C. Zimmermann.

Injuries of the Eye, With Reference to Accident Insurance.—Wagenmann, A., Professor, Heidelberg. Graefe-Saemisch, Handbuch der gesamten Augenheilkunde. **Second, entirely new, edition, from p. 1121 to p. 1871. Leipzig. Wilhelm Engelmann. 1913. Subscription 20 Mark, $5.00.**

With these installments the second volume of Wagenmann's great work is completed. The first part, from 833 to p. 1120, was reviewed in the October, 1910, number, and the first volume in the October, 1909, number of Ophthalmology, to which we beg to refer. After a detailed review on the experimental investigations, the chemical action of foreign bodies on the human eye is discussed, at first the siderosis, its clinical aspect, pathological anatomy, diagnosis, prognosis and treatment. With regard to the difficult question, whether an operative or expectative treatment is preferable in cases in which a small piece of iron is lodged in the eye for some time, with good vision without irritation or sign of beginning siderosis, generally the operation is advised and waiting only exceptionally, and then only if the injured remains under control. Then the actions of copper, brass, precious metals, lead, zinc, glass, stone, wood on the eye, the injuries by the hairs of caterpillars, with differential diagnosis from tuberculosis, are exhaustively treated.

The next chapter is devoted to the magnet operations, intraocular and extraocular, with an historical introduction, an exposition of the theory of magnets, a description and illustration of numerous eye magnets, and indications. This is followed by a section on foreign bodies in the eyelids, lacrimal apparatus, conjunctiva, cornea, anterior chamber, iris and posterior chamber, lens, vitreous, ciliary body, chorioid, retina, optic nerve, and orbit, with numerous Roentgen skiagraphs. The injuries by thermic, chemical and electric agents and other radiating energies, as luminous and ultraviolet rays, Roentgen and radium rays, receive an exhaustive discourse, closely entering into the action of acids, alkalis, especially lime, ammonia and other substances which coagulate albumen, as soluble combinations of metals, metalloids, alcohol, creosote, aldehyd, chrom, arsenic, iodin, peroxide of hydrogen, then of vegetabilic and animalic poisons, and by synthetic, organic chemical combinations, *e. g.*, anilin, amy nitrite, ethylen chloride, etc. Further subdivisions are the lesions by lightning, electric light, strong electric current, direct sunlight, snow blindness, sunstroke and insolation, glaring by other sources of bright light. The recent experimental researches on the absorption of shortwaved rays in the ocular media and their deleterious influence on the eye are quoted exhaustively. As the best protective glass the neutral glass of

Schott and the dark Hallauer glass are mentioned. The last chapters deal with the injuries of the eye by explosions, small and large projectiles, with numerous Roentgen skiagraphs, and the lesions of the eye subsequent to injuries of the body, as in combustions, caisson diseases, compression of the chest and abdomen, and rupture of the liver. The literature is exhaustively utilized not only by the very complete bibliographies at the end of each chapter, but especially by very good abstracts of the original works with very valuable casuistics. By this feature the usefulness of this elaborate work is greatly enhanced, which by its completeness and accuracy is of immense practical value. C. ZIMMERMANN.

Handbook of General Pathology.—Krehl, L., Prof., Heidelberg, and **Marchand, F., Prof.,** Leipzig. "Handbuch der allgeneinen Pathologie." In conjunction with Aschoff, L., Freiburg in Br.; Askanazy, M., Genf.; van Baumgarten, P., Tuebingen; Beneke, R., Halle; Boehn, R., Leipzig; Ernest, P., Heidelberg; Fischler, F., Heidelberg; Fraenkel, C., Halle; Henke, F., Koenigsberg i. Pr.; Hering, E., Prag.; von Hess, C., Würzburg; Hirsch, K., Goettingen; Hoche, A., Freiburg i. Br.; Klemensiewicz, R., Graz; Kraus, F., Berlin; Kretz, R., Würzburg; Luethje, H., Kiel; Moritz, F., Koeln; Paltauf, R., Wien; Minkowski, O., Breslau; von Romberg, E., Tuebingen; Schmidt, M. B., Marburg; Schwenkenbecher, A., Frankfurt a M.; Sobernhein, G., Berlin. Volume II, Part 2. General pathology of circulation II, of the psychical functions, visual sense, and secretion I. 535 pages with 38 partly colored figures. Leipzig. S. Hirzel, 1913. 19 mk., $4.75.

The first part of the second volume of this important work, which gives a comprehensive presentation of the doctrine of the pathological processes, including their causes, was reviewed in Ophthalmology, Vol. IX, No. 2, January, 1913, p. 314. In the second part the general pathology of circulation is continued, commencing with the essays of F. Moritz and D. von Tabord on the general pathology of the heart and the blood vessels. The anomalies of the dynamics of the heart and vessels are preceded by a physiological introduction on the muscular apparatus, the work, energy, adaptation, power of contraction, etc., of the heart and blood vessels, and are considered under weakness, hypertrophy, compensation, and its disturbances. Then the anomalies of the factors determining the blood pressure are discussed: elasticity, capacity, and filling of the vascular lumen, followed by anomalies of the beat and current volumes, viscosity of the blood, vascular tonus pressory properties of adrenalin, the anomalies of the blood pressure, of the pulmonary circulation, and the relations of the nervous system to the organs of circulation, anomalies of the succession and frequency of heart beats.

Chapters 6 and 7 on thrombosis and embolism, by R. Beneko, contain very interesting historical introductions and an exhaustive discourse on the morphology of coagulation, general morphology, etiology, topography and semiology of thrombosis, power and direction of the blood or lymph current as the determining forces and paths of embolism, different kinds of embolisms, anatomical and clinical sequels, and occurrence of embolism.

The next chapter on disturbances of psychical functions by A. Hoche is a splendidly written essay on the question what at the best can be expected from pathological anatomy for the understanding of morbid psychical disorders. Any attempt at correlating certain anatomical changes of the brain to the majority of phenomena of abnormal psychical life meets with difficulties which H. considers insurmountable. The hope of gaining a universal anatomo-pathological base of psychical diseases seems utopic. He says we do not possess a pathological anatomy of psychoses, not because the methods are insufficient, but we shall not and cannot possess it, because the material processes which run parallel to the psychical in the proper sense of the word, are probably neither by seat nor manner such that they would be microscopically demonstrable. He believes that one must imagine that a large part of the specific parenchyma of the brain simultaneously participates in the evolution of normal and morbid psychical processes, and that we shall more readily explain psychical abnormities by a shifting of dynamic reciprocity of large portions of the brain than by localized disturbances of single anatomical elements.

The general pathology of the visual sense by Carl von Hess is introduced with the remark: The morphological peculiarity of our visual organ is essentially determined by the concentration of very heterogeneous, partly highly differentiated, tissues in a relatively small space. The same may be said of this chapter, admirable in its conciseness and the completeness with which the essential general pathology of the dioptric apparatus, functional disturbances from diseases of the cornea, lens, vitreous, anomalies of refraction and accommodation, diseases of the light perceiving parts, the conducting paths, the central nervous system, the disturbances of the ocular movements and sympathetic ophthalmia, are presented in a most fascinating style.

In the tenth chapter the pathological disorders of the secretion of the skin receive a very able exposition by A. Schwenkenbecher, and in the eleventh chapter the disturbances of the secretion of the liver and pancreas by A. R. Kretz and B. K. Helly.

Like in the preceding volumes, also in this part a bibliography is appended to each chapter, and carefully prepared indexes of subjects and authors and a special table of contents, greatly facilitate orientation. The collaborators have done their best to fully impart also to this volume the superior value which recommended so much its predecessors. C. ZIMMERMANN.

The Origin of the Spheric Refractions of the Human Eye. (Hypermetropic, Emmetropic, Myopic).—Steiger, Adolf, Zürich; 567 pages with 15 illustrations in the text. Berlin, 1913. S. Karger. 15 Karstrasse, 18 Mk., $4.50.

The author says it was his aim to investigate the causes of all conditions of spherical refraction,—probably for the first time in ophthalmological literature,—comprising under them the development of myopia as a special case. He claims that only this conception that the problem of the development of myopia is merely a part of the study of refraction and can be understood only in connection with the nature of hypermetropia and emmetropia, opens any prospects of discarding the old methods of researches on myopia, which in his opinion are not capable of leading to a solution of the myopia question. By his examinations of over 46,000 children of the first school year, and the re-examination of a large number of them 5½ years later, gave him the conviction of the total untenability of the so-called school myopia. The greatest surprise for him was the total lack of proofs for the most important supports of the myopia theories. In his opinion the argumentation of school myopia turned in a circle: The supposition of the development of myopia by near work was supported by the increase with the school years and the increase with the school years was made dependent upon its development by near work. Also the assumption of a predisposition created the greatest contradictions. These difficulties might have been overcome long ago, if the material available for years had been utilized. The undoubted inequality of the refraction of the new born, of different species of animals, and within the same species, which often are myopic, illustrates, as S. sets forth, the general law that all morphological elements of the human and animalic organism have their curve of variability, and imposes the duty to approach the problem of refraction from more general points of view than it has been the custom for decades.

Thus he develops his views by entering in great detail into the statistics of the doctrine of refraction and the opinions of the authors on the etiology of myopia, with criticism of the satistics and

myopia theories, the methods of investigation of heredity and views of the authors thereon, and chapters on the laws of heredity, the significance of the corneal refraction for the question as to heredity, and the hereditary transmission of acquired properties. Then the importance of variability for the doctrine of refraction is discussed under the variability of the optical constants, of corneal refraction and length of the ocular axis, the total refraction to be expected, corneal and axial myopia. The last chapter on the etiology of the various spherical refractions from embryological causes considers the development of emmetropia, which S. regards as a functional and not a morphological question, the development of hypermetropia and myopia, the various forms of myopia in the light of embryological conception, the various kinds of refraction as closed biological unities, the significance of myopia, myopia as an adjustment to the requirements of culture, selection and elimination, myopia in certain vocations, the so-called increase of myopia in the 19th century and its asserted decrease in consequence of hygienic measures, outlooks into the future, refraction of animals, asymmetry and curve of refraction.

According to S. school myopia in the sense of the former authors does not exist. Hence it cannot be prevented or checked by diminution of school work. He believes that only by genealogical researches the many unsolved problems of the etiology of refraction can be cleared, for which he urges the collection of a useful material of facts. Whether one agrees or not with the views of the author, the elaborate work contains numerous new points of perspective which will be read with great interest and will be a stimulation in future researches. C. ZIMMERMANN.

Lang's German-English Dictionary—Meyers, Milton K. P. Blakiston's Son & Co., 1012 Walnut St., Philadelphia, Pa., 1913. Price, $5.00 net.

This volume of 564 pages has 49,400 definitions, therefore containing not only standard terms but also much nomenclature that is somewhat uncommon but which is occasionally found in German Medical Literature. The dictionary is intended to be a complete glossary of German medical words in common use; containing also a large number of terms employed in the ancillary sciences, particularly Chemistry, Biology and Pathology. It will be found of use in reading and translating German. The dictionary only goes one way, from German into English. It is therefore not as complete a work as general German-English dictionaries, as Cas-

sell's. The book is heartily recommended for the library of the scientific physician. H. V. Würdemann.

The Prescriber.—A monthly journal dealing with therapeutics and treatment. Published at 137 George St., Edinburgh, Scotland.

The June number of this well known magazine is devoted almost exclusively to the Therapeutics associated with Ophthalmology. Following a brief editorial come two original articles, the first on Hydrogen Peroxide, by P. A. Harry, and the second on The Value of Eucaine in Ophthalmic Work, by J. Allan. Both are valuable and instructive and deal lucidly with the subject. We note the omission in the former of the benefit of hydrogen peroxide in post cataract infection which the late Dr. Hancock in the Royal London Ophthalmic Hospital reports speaks so highly of.

The remainder consists of abstracts from current literature dealing with the therapeutics of eye work. A. A. Bradburne.

The American Encyclopedia and Dictionary of Ophthalmology. Wood, Casey A. Cleveland Press, Chicago, Ill., 1913. Price —— Assisted by a large staff of Collaborators. Fully illustrated. Vol. I, Letter A.

Of this monumental work has appeared the subject matter embracing the whole range of literature of ophthalmology and its related sciences, in addition to which is combined a dictionary of such English, Latin, French, German and Italian words and phrases as will be most useful to students of Ophthalomology. Despite all the words and phrases contained in this enormous undertaking which is projected to go through at least ten volumes, words fail the reviewer to give the reader a complete understanding of the extent of this work and of the benefit it will be to the library of the ophthalmologists. All he can say at present is, buy it for not only will the reader find definitions therein of words and phrases, but complete articles of exhaustive type of any and all subjects pertaining to the literature and practice of ophthalmology. The work is well illustrated as well as printed. H. V. Würdemann.

Correction.—In our review of Devereux Marshall's book on Diseases of the Eyes, April, 1913, page 451. The chapter on Edridge-Green's Theory of light and color vision was written by the author but read and approved by Edridge-Green. A. A. Bradburne.

Notices

Dr. L. Webster Fox, of Philadelphia, was elected a trustee of the Chapin Memorial Home for the Aged Blind at the last meeting of the Board, to serve until 1916.

Dr. Nelson Miles Black and F. A. Vaughn of Milwaukee have been writing some excellent articles upon visual and lighting requirements for some of the special scientific journals. We are pleased to see co-operation between the ophthalmologists and illuminating engineers to the end that publishers shall be made to see the advisability of using paper free from glare, that school boards shall be awakened to the requirements of lighting and light effects in the school rooms and that they shall demand school books which are printed upon paper free from specular reflections. Mr. Vaughn's article in the *Electrical Review* on "The Illumination of the Home" is of much interest and shows how the scientific side of the subject is receiving consideration. We are certainly advancing into the light of scientific achievement regarding these subjects. The ophthalmologist has labored long to bring the lay public to a better understanding of the needs of protecting the eyes against strain, and it is very gratifying to see that the scientific press has seen fit to devote so much space to this very important subject.

MELVILLE BLACK.

Tiès Honoré et Éminent Collègue

Le Bureau de la Sociètè belge d'Ophthalmologie a l'honneur de vous rappeler que la réunion á laquelle elle vous a invitè, á l'occasion de l'Exposition Universelle de Gand, aura lieu dans cette ville, les 2 et 3 août prochains.

Le programme *scientifique* provisiore du Congrès comportait au 1er mai, á l'Étranger, l'adhesion de:

MM. les docteurs Ch. Abadie (Paris), Chevallereau (Paris), Prof. Fuchs (Vienne), Prof. E. De Grosz (Budapest), Prof. Dr. Hertel (Strasbourg), Prof. C. von Hess (Munich), Prof. Dr. J. Hirschberg (Berlin), Dr. Holth (Christiania), Prof. Dr. H. Kuhnt (Bonn), Prof. Lagrange (Bordeaux), Dr. E. Landolt (Paris), Prof. de Lapersonne (Paris), Prof. Motais (Angers), Morax (Paris), Dr. H. Pagenstecher (Strasbourg), Prof. O. Parisotti (Rome), Prof. Pfalz (Düsseldorf), Prof. Rollet (Lyon), Dr. Kurt Steindorf (Berlin), Dr. A von Szily (Fribourg), Prof. Uhthoff (Breslau), Prof. Wieherkiewicz (Cracovie).

Le Secrètaire gènèral prie les Collégues ètrangers et règnicoles participant aux travaux de la rèunion et qui n'ont pas encore fait connaître el titre de leur communication au Congrès, de la lui faire parvenir *avant le* 20 *juin.*

Le programme du Congrès paraitra le ler puillet.

Pour le Bureau :
Le Secrètaire gènèral,
Prof. van Duyse.

OPHTHALMOLOGY

ESSAYS, ABSTRACTS AND REVIEWS

VOL. IX. JULY, 1913 No. 4

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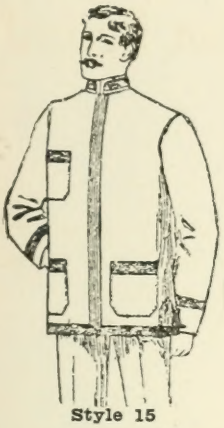

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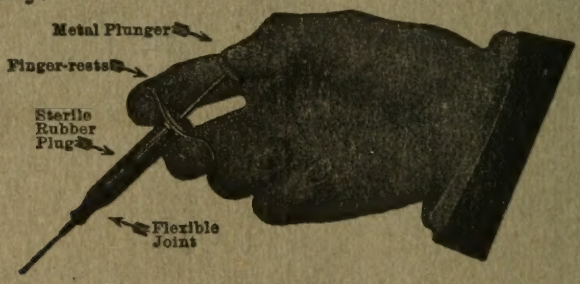

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